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REVISION OF THE AFRICAN LIZARDS OF THE
FAMILY CORDYLIDAE

BY ARTHUR LOVERIDGE

WITH TWELVE PLATES

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No. 1.—Revision of the African Lizards of the Family Cordylidae

By ARTHUR LOVERIDGE

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INTRODUCTION

That the name ZONURIDAE should have been employed by Boulenger (1884a), was most unfortunate, for *Zonurus* Merrem (1820) was antedated by *Cordylus* Laurenti (1768), as has been pointed out by Stejneger (1936b). As article 5 of the International Rules of Nomenclature requires that the family name be based on the type genus, CORDYLIDAE must replace ZONURIDAE, however much such major changes are to be deplored.

In 1885 Boulenger recognized the family as comprised of 14 species, as against 48 forms enumerated in the present revision. In 1930 Power, when preparing a key to the South African species of the genus "*Zonurus*", listed 18 members and, though two of these (*capensis* and *robertsi*) are here transferred to *Pseudocordylus*, no fewer than 28 species and races of *Cordylus* are accepted in the present paper. Apart from desultory comments, no revisionary work¹ has been done on *Pseudocordylus* or *Platysaurus*, but Boulenger (1899c) furnished a synopsis of the 7 species of *Chamaesaura*, now reduced to 5 forms by synonymy.

The present revision, like others in the series², is an attempt to furnish a synopsis of all additions to our knowledge of the family since 1885, and a serious endeavour to arrange its members according to probable lines of evolution. In this connection I entertain doubts as to

¹ The present revision (completed in the summer of 1942) was just going to press (1944) when a copy of FitzSimons' (1943) "The Lizards of South Africa," was received. The two new races of Cordylidae which he describes have been included or discussed in this revision and a few footnotes and comments inserted, but his book must be consulted for other data, English names for most of the species, and many fresh locality records. While we are in substantial agreement as to the entities of most forms, my phylogenetic conclusions are so widely divergent from the arrangement devised by FitzSimons that it must be left to others to decide which more truly represents the probable lines of descent.

² Revision of the African Lizards of the Family Amphisbaenidae, 1941, Bull. Mus. Comp. Zoöl., 87, pp. 353-451.

Revision of the African Lizards of the Family Gerrhosauridae, 1942, Bull. Mus. Comp. Zoöl., 89, pp. 483-543., etc.

whether the order in which the species of *Cordylus* are arranged, should not be largely reversed; it is difficult to believe that so well protected a species as *giganteus* should have given rise to less spinose forms without osteoderms, though such species might gain in activity. However, without adequate grounds for change I have accepted Boulenger's order though attracted by the idea that *Platysaurus*, through *Pseudocordylus*, gave rise to some species of *Cordylus* like *caeruleopunctatus* lacking osteoderms. Cape Province, inhabited by 19 species or races, or the mountainous Transvaal with 17, would certainly appear to be the centre of speciation.

This opportunity is taken of expressing my deep appreciation of the kindness shown by Dr. V. FitzSimons of the Transvaal Museum in checking over my redescrptions of five of the *Cordylus* described by him and inserting additional information regarding them; for amending the spelling of many place names and answering numerous questions as will be seen from the footnotes. It is with much pleasure that one of the two novelties:

PLATYSAURUS GUTTATUS FITZSIMONSI subsp. nov.

is named after the author of "The Lizards of South Africa." The other:

PSEUDOCORDYLUS LANGI spec. nov.

is named for Mr. Herbert Lang whose activities have enriched so many collections and greatly contributed to our knowledge of the reptiles of Africa.

I wish also to thank Dr. Walter Rose for generous permission to reproduce figs. 2 and 3, on pls. vi and xii respectively, which are taken from his book "Veld and Vlei."

Geographical Distribution
of the family Cordylidae

	Ethiopia	Uganda Protectorate	Kenya Colony	Tanganyika Territory	Mozambique	Nyasaland	Northern Rhodesia	Southern Rhodesia	Bechuanaland	Transvaal	Zululand	Natal	Orange Free State	Cape Province	Southwest Africa	Angola	Belgian Congo
<i>Cordylus giganteus</i>										*							
“ <i>w. warreni</i>										*							
“ <i>w. barbertonensis</i>										*							
“ <i>w. perkoensis</i>										*							
“ <i>w. vandami</i>										*							
“ <i>w. depressus</i>										*							
“ <i>w. laevigatus</i>										*							
“ <i>w. breyeri</i>										*							
“ <i>caeruleopunctatus</i>										*							
“ <i>vittifer</i>										*							
“ <i>c. rivae</i>	*									*							
“ <i>c. tropidosternum</i>			*	*	*	*				*							
“ <i>c. jonesii</i>				*	*	*	*	*	*	*			*				
“ <i>c. angolensis</i>															*	*	*
“ <i>c. rhodesianus</i>							*								*		
“ <i>c. lawrenci</i>																	
“ <i>c. tasmani</i>														*			
“ <i>c. minor</i>												*		*			
“ <i>c. cordylus</i>												*		*			
“ <i>c. niger</i>												*		*			
“ <i>peersi</i>												*		*			
“ <i>ukingensis</i>				*								*		*			
“ <i>macropholis</i>												*		*			
“ <i>calaphractus</i>												*		*			
“ <i>puslulalus</i>												*		*			
“ <i>namaquensis</i>												*		*			
“ <i>campbelli</i>												*		*			
“ <i>p. polyzonus</i>								*				*		*			
“ <i>p. Jordani</i>												*		*			
<i>Pseudocordylus capensis</i>												*		*			
“ <i>robertsi</i>												*		*			
“ <i>langi</i> spec. nov.												*		*			
“ <i>m. melanonotus</i>										*	*	*		*			
“ <i>m. namaquensis</i>										*	*	*		*			
“ <i>m. microlepidotus</i>										*	*	*		*			
“ <i>m. fasciatus</i>										*	*	*		*			
<i>Platysaurus g. rhodesianus</i>							*	*						*			
“ <i>g. fitzsimonsi</i> subsp. nov.								*		*	*			*			
“ <i>g. guttatus</i>								*		*	*			*			
“ <i>g. torquatus</i>				*				*		*	*			*			
“ <i>g. wilhelmi</i>								*		*	*			*			
“ <i>g. minor</i>								*		*	*			*			
“ <i>g. orientalis</i>								*		*	*			*			
“ <i>capensis</i>								*		*	*			*			
<i>Chamaesaura aenea</i>								*		*	*			*			
“ <i>a. anguina</i>			*	*	*			*		*	*			*			
“ <i>a. lenuior</i>					*			*		*	*			*			
“ <i>miopropus</i>						*		*		*	*			*			
“ <i>macrolepis</i>								*		*	*			*		*	
Total number of forms recorded	1	1	2	4	3	2	0	4	4	17	6	6	5	19	7	2	2

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* Represented in the collections of the Museum of Comparative Zoölogy; examples of species without asterisk are earnestly desired.

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Family CORDYLIDAE

1845. *Zonuridae* Gray (part), Cat. Lizards Brit. Mus., p. 45.
 1845. *Chamaesauridae* Gray, Cat. Lizards Brit. Mus., p. 61.
 1884a. *Zonuridae* Boulenger, Ann. Mag. Nat. Hist. (5), 14, pp. 119, 121.
 1923. *Zonuridae* Camp, Bull. Am. Mus. Nat. Hist., 48, pp. 297, 331.
 1937b. *Cordylidae* Mertens, Abhand. Senckenberg. Naturf. Ges., No. 435,
 p. 8.

For further synonymy see Boulenger, 1885e, Cat. Lizards Brit. Mus., 2, p. 251, from whom the following definition is adapted after incorporation of most of the findings of Camp (1923), who should be consulted for further details.

Habit robust, moderate, or serpentiform; head covered with symmetrical shields; eyes present; eyelids well developed; tympanum distinct or deeply sunken; dentition pleurodont, teeth numerous, small, hollow at the base, with long cylindrical shafts; palate toothless; tongue short, villose, scarcely protractile, entire or very feebly nicked at the end; body scales, if not granular, forming regular transverse series; lateral fold present or absent; limbs well developed or rudimentary or absent anteriorly; femoral pores present (though often indistinct in females); tail stout and spinose, or moderate, or excessively long and fragile.

Skull with both postorbital and frontosquamosal arches present; head with dermal bony shields in *Cordylus*; nasals distinct; frontal, parietal, and premaxillary single; lower jaw composed of six bones; palatines and pterygoids widely separated medially, both bordering the infraorbital fossa; postorbital and frontosquamosal arches bony;

supratemporal fossae roofed over by dermal ossifications; zygosphenal articulation rudimentary; clavicle slender, not dilated proximally, interclavicle cruciform with tendency to dilation; sternum without fontanelle; no abdominal ribs; non-tuberculate osteoderms present in most species of *Cordylus*.

Range. Africa south of Giacorsa, Ethiopia, i.e. about 5° N. (Reported from Madagascar in error by Cope).

Remarks. Camp (1923) places CORDYLIDAE (as ZONURIDAE) in a super-family Zonuroidea at the end of the section Anguimorpha, division Autarchoglossa of the suborder Sauria, thus removing it far from the IGUANIDAE, but placing it near the ANGUIDAE, the two families between which it was accorded an intermediate position by Boulenger (1885e). He would further recognize two subfamilies, i.e. Zonurinae and Chamaesaurinae, the former would now have to be termed Cordylinae.

Key to the Genera

1. Habit serpentiform; limbs short, often rudimentary, or fore limbs absent; uninjured tail at least thrice the length of head and body; ear-opening moderate or small; no collar fold; ventrals lanceolate like dorsals. *Chamaesaura*
(p. 98)

Habit normal; limbs well developed, pentadactyle; tail less than twice the length of head and body; ear-opening large; a collar fold at least laterally distinct; ventrals squarish or transversely enlarged. 2
2. Dorsal lepidosis entirely granular; usually a color pattern of three, light, longitudinal lines, or series of spots, on back, though sometimes absent in old males. *Platysaurus*
(p. 82)

Dorsal lepidosis heterogeneous or composed of large scales 3
3. Nape covered with granules, or if dorsals extend to occiput they are much reduced; back usually covered with granules intermixed with nodular scales or dorsals, the latter small, soft, and devoid of underlying osteodermal plates. *Pseudocordylus*
(p. 66)

Nape covered with well developed scales like the dorsals, the latter strong, usually¹ with underlying osteodermal plates. *Cordylus*
(p. 9)

¹ Absent in *caeruleopunctatus*.

Genus CORDYLUS

1763. *Cordylus* Gronovius, Zoophyl., p. 13 (type *cordylus* Linnaeus). Set aside by action of International Commission of Zoological Nomenclature (Opinion 89).
1768. *Cordylus* Laurenti (part), Syn. Rept., p. 51 (type *verus* Laurenti = *cordylus* Linnaeus).
1820. *Zonurus* Merrem, Versuch Syst. Amphib., p. 57 (type *cordylus* Linnaeus).

For further synonymy (but omit *Hemicordylus* Smith), see Boulenger, 1885e, Cat. Lizards Brit. Mus., 2, p. 252.

Head and body depressed; limbs well developed; tail moderate. Head shields regular; nostril pierced in the nasal; eyelids well developed; ear-opening large; 4 parietals; sides of neck covered with scales; no collar fold; dorsals large, usually bony¹, forming regular transverse series extending to occiput; ventrals large, quadrangular or subtriangular, juxtaposed or imbricate, forming longitudinal and transverse series; femoral pores present in both sexes; digits slightly keeled inferiorly; tail spinose.

Those species which I have examined appear to have the following characteristics in common, consequently these have been omitted from the specific descriptions.

Head longer than broad; rostral at least twice as broad as high; postnasal present only as an aberration; a preocular; anterior supra-ocular longest, the second broadest; frontal subpentagonal or subhexagonal, slightly broader anteriorly; occipitals present (except in *caeruleopunctatus*); mental rather large; a slight lateral fold; a pair of enlarged preanals (though in *p. polyzonus* and *p. jordani* occasionally subequal, and said to be so in the juvenile type of *c. rivae*); limbs above with large, keeled spinose, imbricate scales.

Range. Africa, in savanna areas south of Ethiopia, i.e. about 5° N.

Remarks. Stejneger (1936b, p. 137) has set forth the reasons for recognizing *Cordylus* Laurenti, in contradistinction to *Cordylus* Gronovius, and regarding Merrem's monotypic *Zonurus* as a synonym.

Despite the fact that for half-a-century herpetologists have been pointing out the instability in shape (pentagonal, hexagonal, etc.) of head shields in this genus, and consequently their uselessness for taxonomic purposes, others continue to stress these unimportant variations as if they were of value. Which upper labial is lowest and which

¹ No osteoderms in young *giganteus* (fide Broom), or *caeruleopunctatus* which, in the absence of occipitals and reduced nuchals, shows affinities with *Pseudocordylus*.

highest also appears largely fortuitous and might well be dropped from future descriptions though I have included here all the available data for some species. It might be worth pointing out that the subocular descends to the lip in the *warreni* group, *c. niger*, *peersi*, and the two forms of *polyzonus*.

Suboculars normally number 3, with 2 or 4 occurring as variants; in the East African forms of *C. cordylus*, however, 2 has become normal at the expense of the third which has been reduced and pushed to one side, 2 also appears to be normal for a dwarf form (*macropholis*) known only from Kleinsee, Little Namaqualand. Van Dam has recorded 5 for *C. barbertonensis*, but this is apparently due to his inclusion of a small scale not truly a subocular.

Upper labials are normally 5 or 6, with 7 occurring as a common variant; only in the dwarfed *macropholis* are they reduced to 4 with 5 still the normal. Lower labials again are normally 5 or 6, with 7 occurring as a rare variation, here it is the dwarf *ukingensis* (known to me only from the holotype) which has reduced to 4. In the hope that the results might prove useful I counted the gulars lying between the angles of the jaws in all specimens in the Museum of Comparative Zoölogy, however as counts were not available for eight species I was unable to take advantage of this character.

The term postfrontals is employed as preferable to frontoparietals used by Boulenger and some others. As the head is longer than broad in all species except in old males of *cataphractus*, where it is as long as broad, this character has been dropped from the descriptions.

It will be noted that in the majority of species the keels, or spines, on the dorsum and dorsal aspect of the tail are less developed than on the flanks or sides of tail, hence it has not been considered necessary to repeat this for each species. The relative smoothness of the dorsals supposedly facilitates the lizard's entry and withdrawal from beneath boulders, while the lateral spinosities, especially when the lizard inflates, tend to catch on the sides of a rock crevice and prove a supplementary hindrance to the owner being withdrawn.

The state of the "lateral fold," characterized as "distinct," "weak," "slight," or "strong" by various authors, is largely a reflection of the state of nourishment of the individual being described. In an emaciated lizard taken after a prolonged drought it will appear "strong," in a gorged specimen or gravid female, scarcely perceptible. For this reason I have ignored the lateral fold for taxonomic purposes, though undoubtedly some degrees of variation in development occur as between certain species.

Color in members of the genus *Cordylus* seems to be particularly susceptible to environmental changes, as is evidenced by Peers, notes on *cataphractus* (vide p. 55). Too much importance, therefore, should not be attached to color in this genus.

This lizard—*cataphractus*—is the only member of the genus about which we have anything approaching a complete life history, and it is to Peers (1930), whose fascinating account should be consulted for further details, that we are indebted. His paper might well serve as a model to stimulate young South African naturalists to concentrate on other members of the genus with a view to filling in the deplorable gaps in our knowledge of the family.

Key to the Species

- 1. Lower eyelid opaque; supranasals absent..... 2
 Lower eyelid with transparent disk; supranasals present or absent (in one species only)..... 22
- 2. Rostral in contact with frontonasal; occipital spines present..... 3
 Rostral in contact with frontonasal only rarely, usually separated from it; occipital spines absent..... 6
- 3. Median subocular not reaching lip; occipital spines enormous; scales beneath forelimbs smooth; caudal whorls subequal, gradually diminishing towards tip of tail; range: Transvaal; Orange Free State; Cape Province..... *giganteus* (p. 16)
 Median subocular reaches lip between two labials; occipital spines short; scales beneath forelimbs keeled; large caudal whorls separated by smaller ones..... 4
- 4. 34-42 dorsal scales between occiput and base of tail; range: Zululand..... *w. warreni* (p. 19)
 24-32 dorsal scales between occiput and base of tail; range: Transvaal..... 5
- 5. 14-16 ventral scales across the belly..... races of *warreni*¹
 10-12 ventral scales across the belly; range: Waterberg Mountains, northwestern Transvaal..... *w. breyeri* (p. 27)

¹ See full descriptions of various races found in mountains of eastern Transvaal.

6. No occipitals; nuchal scales of first six rows greatly reduced, minute; range: Cape Province. *caeruleopunctatus* (p. 28)
 Occipitals present; nuchal scales moderate or large . . . 7
7. Nuchals comprising foremost, i.e. postoccipital, row, twice as large as those in second row; range: Bechuanaland; Transvaal; Zululand; Natal. *vittifer* (p. 30)
 Nuchals comprising foremost, i.e. postoccipital, row, subequal, certainly *not twice* as large as those in second row. 8
8. Interparietal enclosed between two pairs of parietals . . 9
 Interparietal on a line with anterior parietals and in contact with (rarely separated from¹) the postfrontals. 18
9. Dorsals elongate, the two vertebral rows not or but scarcely enlarged; laterals unlike dorsals. 10
 Dorsals squarish, the two vertebral rows much enlarged; laterals like dorsals. 15
10. Head moderately depressed; temporals moderate; gulars small. 11
 Head much depressed; temporals large; gulars moderate or large. 14
11. Femoral pores 3; nostril said to be pierced in centre of nasal; range: Ethiopia. *c. rivae* (p. 32)
 Femoral pores 5-8; nostril in lower centre of postero-inferior corner of nasal; range: Kenya Colony and countries to the south of Kenya. 12
12. Ventrals in 28-34 transverse rows; size larger, length from snout to vent in adults 82-92 mm.; range: Kenya south to Mozambique and Southern Rhodesia. *c. tropidosternum* (p. 33)
 Ventrals in 22-27 transverse rows; size smaller, length from snout to vent in adults 64-74 mm. 13
13. Southern Mozambique; Southern Rhodesia (south of Bulawayo); Bechuanaland Protectorate (also introduced at Kimberly, Cape Province). *c. jonesii* (p. 36)
 Southwestern Angola (known only from scanty description); probably northern South West Africa; possibly north-central Belgian Congo also. *c. angolensis* (p. 38)

¹ Sometimes in *namaquensis*.

14. Posterior parietals much larger than the anterior; dorsals in 27-28 transverse rows; ventrals in 14 longitudinal rows; range: Southern Rhodesia northeast of Bulawayo *c. rhodesianus*
(p. 40)
- Posterior parietals subequal to the anterior; dorsals in 24 transverse rows; ventrals in 12 longitudinal rows; range: Little Namaqualand *c. lawrenci*
(p. 41)
15. Laterals on flanks slightly smaller than dorsals; range: Uitenhage Division, Cape Province *c. tasmani*
(p. 42)
- Laterals on flanks just as large as the dorsals 16
16. Rostral $2\frac{1}{2}$ -4 times as broad as high; median subocular not, or but rarely, descending to the lip; color above brown or olive with or without markings; range: Cape Province (exclusive of parts of Uitenhage Division) *c. cordylus*¹
(p. 44)
- Rostral $2-2\frac{1}{4}$ times as broad as high; median subocular descending to the lip between fourth and fifth labials; color above uniformly jet black 17
17. Head shields smooth or slightly rugose; nasal moderate, not or but slightly swollen; temporals large, rarely keeled; the two vertebral rows of dorsals enlarged; femoral pores 5-9; range: Cape Peninsula *c. niger*
(p. 48)
- Head shields very strongly rugose; nasal large, very strongly swollen; temporals very large, strongly keeled; vertebral rows of dorsals not differentiated from adjacent dorsals; femoral pores 8-12; range: Little Namaqualand *peersi*
(p. 50)
18. 11-14 gulars between angles of jaws; the two vertebral rows of dorsals enlarged; 14-18 longitudinal rows of dorsolaterals; 9-12 longitudinal rows of ventrals 19
- 16-21 gulars between angles of jaws; vertebral rows of dorsals not enlarged; 20-32 longitudinal rows of dorsolaterals; 14-29 longitudinal rows of ventrals . . . 20

¹See also the recently described *C. c. minor* from Matjesfontein, C. P., said to differ from *c. cordylus* in having 24-36 longitudinal rows of dorsals, 16 rows of ventrals, only 4-6 femoral pores, and smaller size.

19. Gulars small, the anterior not enlarged; dorsals in 30 transverse rows; ventrals obtusely keeled, in 30 transverse rows; range: Southern Tanganyika Territory . . . *ukingensis*
(p. 51)
- Gulars very large, a few anterior ones moderately enlarged followed by a zone of much smaller ones; dorsals in 16-19 transverse rows; ventrals smooth in, 20-22 transverse rows; range: Little Namaqualand . . . *macropholis*
(p. 52)
20. Dorsolaterals in 20-22 longitudinal rows and 15-16 transverse rows; range: Little Namaqualand *cataphractus*
(p. 53)
- Dorsolaterals in 24-32 longitudinal rows and 30-32 transverse rows 21
21. Ventrals in 14 longitudinal rows; range: Central South West Africa *pustulatus*
(p. 57)
- Ventrals in 18 longitudinal rows; range: Southern South West Africa *namaquensis*
(p. 58)
22. Supranasals absent; range: South West Africa *campbelli*
(p. 59)
- Supranasals present; range: South West Africa 23
23. 10-19 femoral pores; upper posterior femorals scarcely larger or more spinose than the anterior; whorls of large scales at middle of tail separated by whorls of smaller ones; a dark streak on side of neck; range: South West Africa south of Aus. *p. polyzonus*
(p. 60)
- 5-8 femoral pores; upper posterior femorals much larger and more strongly spinose than the anterior; whorls of large scales at middle of tail diminishing gradually towards tip of tail; no dark streak on side of neck; range: South West Africa north of Aus. *p. jordani*
(p. 64)

Species	Rostral breadth into height	Supraoculars	Supraclivaries	Suboculars	Upper labials	Lower labials	Gulars between the posterior angles of jaws	Longitudinal rows of dorsals plus laterals	Transverse rows of dorsals	Longitudinal rows of ventrals	Transverse rows of ventrals	Femoral pores
<i>giganteus</i>	2-3	4	3	2-3	5-6-7	5	19-20	20	23-27	10-12	25-28	11
<i>w. warreni</i>	2 1/4-2 3/4	4	3-5	3	5-6-7	5-6	28	20-24	33-42	14	33-35	10-12
<i>w. barbertonensis</i>	2 1/2-2 3/4	4	3-4	3 ¹	5-6	5-6	26	20	28-32	14	31-36	10-12
<i>w. parkmanni</i>	2	4	4	3	5	6	?	18	28	14	26	12-14
<i>w. vandami</i>	2 1/4-2 1/2	4	4	3	5-6	5-6	26-28	20	26-32	14-16	26-35	10-12
<i>w. depressus</i>	2 1/4	4	4	3	6	6	26	16	30	16	30	10
<i>w. loenigatus</i>	2 1/4	4	4-5	3	6	6	?	18	24-26	14	28	10
<i>w. breyeri</i>	2 1/4-2 1/2	4	4-5	3 ²	6	6	?	18	30	10-12	24-26	12
<i>caerulopunctulatus</i>	2 1/4-2 1/2	4	3	3	5-6	5-6	24-30	20-30	40-46	10	28-34	13-15
<i>vittiger</i>	3-4	4	3-4	3	5-6-7	5-6-7	19-24	20-24	23-27	14-16 ³	26-32 ⁴	6-8
<i>c. ritae</i>	?	4	3	3	6	6	?	20	24	12	25	3 ³
<i>c. tropidosternum</i>	2-2 1/2	4	3-4	3	5-6	5-6	22-26	18-22	24-26	12-14	28-30	5-8
<i>c. ionesti</i>	2-3	4	3	3	6	6	19-22	18-22	21-26	12-14	22-26	5-7
<i>c. angolensis</i>	?	4	?	3	?	?	?	24	27-28	14	22-29	5-7
<i>c. rhodesianus</i>	2 1/4-3	4	?	3	6	6	20-23	21-24	27-28	14	22-29	5-7
<i>c. latirami</i>	2 1/4	4	3	3	6	6	?	22	24	12	23	8
<i>c. tasmani</i>	2 1/2-3	4	3	3	5	5	16-18	16-18	25-28	10-12	23-29	6-7
<i>c. minor</i>	?	4	3	3	6	5	?	24-26	27-28	16	24-26	4-6
<i>c. cordylus</i>	2 1/2-4	3-4	3	3	5-6	5-6	16-20	16-20	25-29	10-14	23-30	6-9
<i>c. niger</i>	2-2	4	3	3	5	5	18-20	16-20	25-28	10-12	25-29	5-9
<i>peersi</i>	2-2 3/4	4	3-4	3	5	5	14-15	16	22-24	10-12	23-29	8-12
<i>ukingensis</i>	2 1/4	4	?	3	5	4	?	14	30	10	30	5-7
<i>macropholis</i>	2 1/4-2 3/4	4	3-4	3	4-5	5-6	11	14-16	16-19	10-12 ⁶	20-22	6-10
<i>cataphractus</i>	2-2 1/2	4	?	3	5-6-7	5-6	17-21	20-22	17-22	15-16	24-30	12-16
<i>pustulatus</i>	?	4	?	3-4	6	6	?	27-29	30-32	14	24-25	?
<i>nanaquensis</i>	2-2 1/4	4	?	3	5-6	4-5-6	16-18	24-32	31	16-18	26-30	9-10
<i>campbelli</i>	2 1/4	4	3	3	6-7	4	18	27-30	30-32	16-18	25-28	4
<i>p. polyzonus</i>	2 1/4-4	4	3	3	6-7	4	17-20	28-40	32-46	18-24	31-40	10-19
<i>p. jordani</i>	2 1/2-3 1/4	4	3	3	5-6	5-6-7	18-20	30-35	30-40	18-22	35-40	4-8

1 5 *vide* Van Dam (1921a), an error due to inclusion of 2 small scales.
 2 4 *vide* van Dam (1921a), probably due to difference in method also.
 3 18 *vide* Sternfeld (1911b), possibly something else included in series.
 4 24 *vide* Sternfeld (1911b), possibly something else included in series.
 5 3 *vide* Boulenger (1896b), because it is juvenile states the author.
 6 9 *vide* Power (1930).

CORDYLUS GIGANTEUS Smith

Plate 1, figs. 1-2

1844. *Cordylus giganteus* A. Smith, Ill. Zool. S. Africa, Rept., pls. xxxv-xxxvi: "Quathlamba" i.e. Drakensberg Mountains. Orange Free State.
1938. Gorham & Ivy, p. 179.
1845. *Zonurus derbianus* Gray, Cat. Lizards Brit. Mus., pp. 48, 270: South Africa.
- 1890a. Müller, p. 286.
1897. Bateman, p. 106.
- 1885e. *Zonurus giganteus* Boulenger, p. 253.
- 1890b. Müller, p. 699.
- 1893a. Boettger, p. 66.
1897. Bateman, p. 106.
1898. Selater, p. 103.
1901. Gadow, p. 536, fig. 135.
- 1909a. Hewitt, p. 35.
- 1910b. Boulenger, p. 467.
1910. Ditmars, p. 155, pl. xxxi, fig. 2.
- 1910a. Hewitt, p. 60.
1911. Gilchrist, p. 230.
- 1911b. Hewitt, p. 47.
1913. Broom, p. 548, pl. lxxiv.
1913. Boulenger, E.G., p. 72, pl.-
1913. Hewitt & Power, p. 153.
- 1913a. Werner, p. 108, pl. -
- 1914a. Hewitt, p. 240, map.
1920. Hewitt, pp. 91, 93.
- 1921a. Dam, p. 242.
- 1925b. Flower, p. 945.
1929. Rose, p. 100.
1930. FitzSimons, V., p. 29.
1930. Power, p. 14.
1930. Schmidt, p. 153.
1932. FitzSimons, F. W., p. 212.
- 1935b. FitzSimons, V., p. 349.
1935. Lawrence, p. 44.
- 1937a. FitzSimons, V., p. 266.
1937. Lawrence, p. 109, fig.

Names. Giant Girdle-tail (English); *sonkyker* or *ouvolk* (Afrikaans).

Description. Head slightly depressed; head shields strongly rugose; rostral in contact with the frontonasal, which is longer than broad, as

long as broad, or shorter than broad; nostril pierced in the postero-inferior corner of a nasal which is not much swollen; a loreal; a pre-ocular; median subocular not descending to the lip; fourth or fifth upper labial smallest, fifth not higher than others; prefrontals forming a suture; frontal hexagonal; postfrontals longer than broad; interparietal on a line with, and as large as, the anterior parietals, forming a suture with the postfrontals; posterior parietals much larger than the anterior; 4 large, striated, occipital spines, the inner shorter and slightly curved inwards, the outer largest and slightly curved inwards, or straight, or directed obliquely outwards, as long as, or longer than, the three anterior supraoculars; temporals large, rugose, keeled, the hindmost subtriangular, slightly curved and bluntly pointed; sides of neck with large, sharp, slightly curved or erect spines; gulars small, the anterior irregularly enlarged, the median slightly imbricate, smooth, or the lateral obtusely keeled; collar scales large, keeled, lanceolate, mucronate.

Dorsals subquadrangular, rugose, strongly keeled, sharply mucronate, the vertebral row often somewhat smaller; laterals keeled, spinose, separated by granular interspaces; ventrals subquadrangular, the median smooth and strongly imbricate, the lateral obtusely keeled and shortly mucronate; scales below both fore and hind limbs smooth; tail with whorls of large, rugose, strongly keeled but not serrate, spinose scales above and on sides, the lateral spines longest; subcaudals elongate, narrow, smooth or obtusely keeled.

For characters common to all species, see p. 9; for scale and pore counts, see statistical table on p. 15. In *L. giganteus* all scales are said to be more strongly imbricate and all spines less developed.

Color. Above, head dark brown, lip to ear yellow; back yellowish clouded with dark brown. Below, gular region and belly whitish or yellowish, uniform.

That of the young, according to Smith: Above, head anteriorly light yellowish brown clouded with liver brown; temples liver brown irregularly spotted with greenish white; posterior part of head, back and sides intermediate between umber and liver brown, the back, limbs, and tail irregularly barred with narrow yellow cross-bands; tail-tip orange red. Below, creamy yellow, except tail-tip which is orange red. For detailed description of a still earlier stage, and coloured plate of mother and young, see Broom (1913).

Size. Total length of a ♂ type (? *derbianus*) 382 (202 + 180) mm. (Boulenger, 1885e). Smith's measurements of 8 + 7 inches (= 204 + 179) mm., for a ♂ cotype, is rejected by FitzSimons (1937a) who

remeasured it as 351 (191 + 160) mm. Total length of a ♀, 365 (195 + 170) mm. (FitzSimons, 1937a). There is nothing to support the statement by Rose (1929) that the species attains "nearly two feet," though it appears to have been copied by later authors.

Anatomy. The so-called branchial arch is discussed by Hewitt (1920), the gall bladder by Gorham and Ivy (1938).

Longevity. Four years, six months, and nineteen days, is the longest of six records furnished by Flower (1925b).

Diet. In captivity, cockroaches, mealworms, tiny frogs, baby mice, and raw meat (Bateman, 1897).

Parasites. No mites were found on those examined by Lawrence (1935).

Defence. F. W. FitzSimons (1932) records that when a hungry mole snake (*Pseudaspis cana*) was presented with one of these spiny lizards, the serpent stalked, seized, and began to constrict it with three coils; for a time it tightened its coils, then, suddenly relaxing them, dashed away.

Similarly a captive puff adder (*Bitis arietans*), having seized a girdle-tailed lizard by the head, began to engulf it in leisurely fashion. The lizard, however, which had been quiescent up to this point, began to slew round and round and to belabour the snake so effectively with its spinous tail that the viper was glad to disgorge its prey and retire from the contest.

Habits. According to V. FitzSimons (1935b), these big lowland lizards are fairly common in the open flat country east of Kroonstad, where they may be seen sunning on small mounds or anthills. When disturbed they disappeared into burrows—apparently those of gerbils.

Its custom, when basking, of carrying its head high and facing the sun, has won for it the name of "sun-gazer" among the Dutch (Rose).

Apparently unused to water in their rocky haunts, these lizards would scuttle into a moat "swim frantically for a few seconds, then sink like a stone to the bottom," there to remain until drowned (F. W. FitzSimons, 1932).

In Europe captive girdle-tails require artificial heat of from 70° to 85° F., except during the summer months (Bateman, 1897).

Localities. **Transvaal:** Heidelberg; Paardekop Station, Standerton District; Schaapplaats, Vereeniging District; Zandspruit, Wakkerstroom District. **Orange Free State:** Bethlehem; Bloemfontein; Lower western slopes Drakensberg Mountains; Geluk Farm, 20 miles west of Kroonstad; Harrismith; Hoopstad; Kroon-

stad; Ventersburg. **Cape Province:** Colesberg (over s.w. border from Orange Free State).

Range. Southern Transvaal, Orange Free State and adjacent areas in Cape Province and Basutoland.

CORDYLUS WARRENI WARRENI (Boulenger)

Plate 1, fig. 3

- 1908b. *Zonurus warreni* Boulenger, Ann. Natal Govt. Mus., **1**, pp. 224, 232
pl. xxxv: Ubombo, Zululand.
1909a. Hewitt, p. 36.
1910b. Boulenger, p. 468.
1910a. Hewitt, p. 60.
1930. FitzSimons, p. 30.
1930. Power, p. 14.
1935. Lawrence, p. 43.
1937. Lawrence, p. 111.

Description. Head slightly depressed; head shields rugose; rostral narrowly in contact with the frontonasal, which is as long as broad; nostril pierced in the postero-inferior corner of a nasal which is not much swollen; a loreal; a preocular; median subocular descending to the lip between the third and fourth or fourth and fifth upper labials; fourth, fifth, or sixth upper labial smallest, fifth not higher than others; prefrontals forming a broad or narrow suture, or separated; post-frontals shorter than broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 6 rugose, pointed occipitals; temporals rugose, keeled, the hindmost subtriangular, slightly curved and bluntly pointed; sides of neck with large, sharp, erect spines; gulars small, the anterior irregularly enlarged, the median not imbricate, smooth, or the lateral obtusely keeled; collar scales enlarged, keeled, the lateral mucronate.

Dorsals subquadrangular, rugose, strongly keeled, lateral shortly mucronate, the two vertebral rows reduced; laterals keeled, spinose, separated by granular interspaces; ventrals quadrangular, the median smooth (in females) or obtusely keeled (in males), not, or but slightly imbricate, the lateral obtusely keeled and shortly mucronate; scales below fore limbs keeled, below hind limbs smooth or obtusely keeled; tail with whorls of large, rugose, strongly keeled but not serrate, spinose scales, alternating with whorls of smaller scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9, for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown, lip to ear yellow; back brown, flecked with black-edged, yellow spots forming more or less regular transverse series. Below, gular region whitish with brown infuscations; belly yellowish white, uniform.

Size. Total length of ♂ type, 270 (110 + 160) mm.; of a totypic ♀ (M.C.Z. 21442), 267+ (122 + 145+) mm.

Remarks. None of the citations given above, excepting that of Lawrence, contribute to our knowledge.

Breeding. In March and November ova are small (M.C.Z. 21442, 41881).

Diet. Thirty-two *Eristalis* maggots, each about 20 mm. long, and fragments of a large snail's shell in one; millipedes and ants in another; a large grasshopper in a third (A.L.).

Parasites. Mites (*Zonurobia debilipes*) described from this species by Lawrence (1935). Nematodes (*Thubunaea* sp., probably *T. agamae* Sandground, and Heterakidae, probably *Spinicauda* sp.), and trematodes (*Mesocoelium* sp.) were taken from totypic lizards in the Museum of Comparative Zoölogy. I am indebted to Messrs Allen McIntosh and J. T. Lucker for making the indentifications.

Localities. **Zululand:** Ubombo.

Range. Zululand.

CORDYLUS WARRENI BARBERTONENSIS (van Dam)

1921a. *Zonurus barbertonensis* van Dam, Ann. Transvaal Mus., 7, p. 240, pl. iii: Barberton, Transvaal.

1930. FitzSimons, p. 29.

1930. Power, p. 14.

1935. Lawrence, p. 43.

Description. Head slightly depressed; head shields rugose; rostral in contact with the frontonasal, which is as long as broad, or shorter than broad; nostril pierced in the postero-inferior corner of a nasal which is not much swollen; a loreal; a preocular; median subocular descending to the lip between the fourth and fifth upper labials; fourth or fifth upper labial smallest, fifth not higher than others; prefrontals forming a suture; postfrontals shorter than broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 6 rugose, pointed occipitals; temporals rugose, keeled, the

hindmost subtriangular, slightly curved and bluntly pointed; sides of neck with large, sharp, erect spines; gulars small, the anterior irregularly enlarged, the median not imbricate, smooth, or the lateral obtusely keeled; collar scales enlarged, keeled, the lateral mucronate.

Dorsals subquadrangular, rugose, strongly keeled, lateral shortly mucronate, the two vertebral rows reduced; laterals keeled, spinose, separated by granular interspaces; ventrals quadrangular, the median smooth, not, or but slightly imbricate, the lateral obtusely keeled and shortly mucronate; scales below fore limbs keeled, below hind limbs smooth or obtusely keeled; tail with whorls of large, rugose, strongly keeled but not serrate, spinose scales, alternating with whorls of smaller scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9, for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown flecked with yellow, lip to ear yellow; back, blackish brown flecked with yellow spots forming more or less regular transverse series. Below, gular region whitish with brown infuscations; belly brownish variegated with yellow anteriorly and on the flanks.

Size. Total length of ♂ type, 312 (138 + 174) mm.

Remarks. Its describer states that *barbertonensis* differs from *breyeri* "in size of the occipital spines, and number of transverse series of dorsal scales." While this is correct, it will be seen from the statistical table that the latter difference is bridged by intermediate forms. There are other differences separating this, the best marked, race from *breyeri*. I proposed treating *barbertonensis* and allied forms as races of *breyeri*, but follow FitzSimons (1943) in regarding them as forms of *warreni*.

Parasites. Mites (*Zonurobia transvaalensis*) were described from this race by Lawrence.

Localities. **Transvaal:** Barberton.

Range. Transvaal (Barberton only).

CORDYLUS WARRENI PERKOENSIS (FitzSimons)

Pl. e 2, fig. 1

1930. *Zonurus vandami perkoensis* FitzSimons, Ann. Transvaal Mus., 14, pp. 27, 30, figs. 8-9: Perko Farm, near Olifants River, eastern Transvaal.

1935. Lawrence, p. 43.

Description. Head slightly depressed; head shields posterior ocular region rugose; rostral in contact with the frontonasal, which is

longer than broad; nostril pierced in the postero-inferior corner of a nasal which is not much swollen; a loreal; a preocular; median subocular descending to the lip between the fourth and fifth upper labials; fifth upper labial smallest, fifth not higher than others; prefrontals forming a suture; postfrontals shorter than broad; interparietal enclosed between 2 pairs of parietals or largely on a line with the anterior parietals, forming, or nearly forming, a suture with the postfrontals; posterior parietals slightly larger than the anterior; 4-5 rugose, pointed occipitals; temporals rugose, keeled, the hindmost subtriangular, slightly curved and bluntly pointed; sides of neck with large, sharp, erect spines; gulars small, the anterior irregularly enlarged, the median not imbricate, smooth collar scales not enlarged mesially, faintly keeled, the lateral keeled and mucronate.

Dorsals subquadrangular to subcircular, finely rugose, strongly keeled, lateral shortly mucronate, the two vertebral rows reduced; laterals keeled, spinose, separated by granular interspaces; ventrals quadrangular, the median smooth, not or but slightly imbricate, the lateral keeled and mucronate, the 2-3 outermost rows much smaller and almost spinose; scales below forelimbs keeled and mucronate, below thigh obtusely keeled and shortly mucronate, below tibia strongly keeled and mucronate; tail with whorls of large, rugose, strongly keeled but not serrate spinose scales, alternating with whorls of smaller scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9, for scale and pore counts, see statistical table on p. 15.

Color. Above, head and back dark brown, uniform except for a few isolated yellow flecks on flanks and tail. Below, gular region yellowish white with brown infuscations; belly mummy brown, uniform except for a series of short, irregular, transverse bars of yellow at sides and some traces of same on limbs; tail with a few scattered flecks of yellowish white.

Size. Total length of ♀ type, 276 (126 + 150) mm.

Remarks. Known only from two females. Its describer states that *perkoensis* differs from *vandami* as follows: "head wider and deeper (as clearly shown in the figures); greater arching of the supraoccipital ridge; well marked suborbital ridge; short contact of the prefrontals; colouring on the whole more uniform." As I have seen neither of the types, I can only add that the grounds for separation appear slender. FitzSimons (1943) continues to regard *perkoensis* as a race of *vandami*.

Breeding. During first week in November (late spring) both females

held eggs, those in the paratype in an early stage, those in the type containing well-formed embryos curled about the yolk.

Parasites. Mites (*Zonurobia transvaalensis*) were described from this race by Lawrence.

Temperament. Gravid females were excessively shy, which, in conjunction with the inaccessibility of their retreats, made them difficult to capture.

Habitat. Living at an altitude of about 5000 feet among huge rock masses which had broken away from the slopes above.

Localities. **Transvaal:** Perkoe Farm near Olifants River.

Range. Transvaal (Eastern only).

CORDYLUS WARRENI VANDAMI (FitzSimons)

1930. *Zonurus vandami* FitzSimons, Ann. Transvaal Mus., **14**, pp. 25, 30, figs. 6-7: Gravelotte, near Leydsdorp, eastern Transvaal.

1935. Lawrence, p. 43.

Description. Head slightly depressed; head shields rugose; rostral in contact with the frontonasal, which is longer than broad or as long as broad; nostril pierced in the postero-inferior corner of a nasal which is not much swollen; a loreal; a preocular; median subocular descending to the lip between the third and fourth or fourth and fifth upper labials; fourth or fifth upper labial smallest, fifth not higher than others; prefrontals forming a suture; postfrontals longer than broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 4-8 rugose, pointed occipitals; temporals rugose, keeled, the hindmost subtriangular, slightly curved and bluntly pointed; sides of neck with large, sharp, erect spines; gulars small, the anterior irregularly enlarged, the median not imbricate, smooth, or the lateral obtusely keeled; collar scales enlarged, keeled, the lateral mucronate.

Dorsals subquadrangular, rugose, strongly keeled, lateral shortly mucronate, the two vertebral rows reduced; laterals keeled, spinose, separated by granular interspaces; ventrals quadrangular, not, or but slightly imbricate, the lateral obtusely keeled but not shortly mucronate; scales below fore limbs keeled, below hind limbs smooth or obtusely keeled; tail with whorls of large, rugose, strongly keeled but not serrate, spinose scales, alternating with whorls of smaller scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9, for scale and pore counts, see statistical table on p. 15.

Color. Above, head and back dark brown to sepia, a yellow, irregular, transverse bar on nape, four others on body, one at root of tail; similar yellow barring on limbs and tail. Below, yellowish with brown infuscations; tail broadly banded with yellow.

Size. Total length of ♂ paratype (T.M. 7410), 273 (155 + 118) mm.; of type ♀ (T.M. 7407), 287 (155 + 132) mm.

Remarks. Its describer states that *vandami* differs from *barbertonensis* by its slightly narrower and more depressed head, greater rugosity of head shields, and 4 occipitals. The paratype series of 8 lizards, however, was comprised of individuals with 4, 5, 6 (M.C.Z. 41876), and even 8 occipitals, the last, as pointed out by FitzSimons, resulting from the subdivision of the original 4, this character, therefore, cannot be considered of diagnostic value, though used as a key character by FitzSimons (1943) who continues to regard it as a full species. In so large a lizard the alleged difference of 25 mm. in size can not have much significance.

Parasites. Mites (*Zonurobia transvaalensis*) were described from this race by Lawrence.

Habitat. Occurs between 4000 and 5000 feet on the northeastern spur of the Drakensberg.

Localities. **Transvaal:** Leydsdorp District: Gravelotte; Malta; Skelem.

Range. Transvaal (Drakensberg Mountains).

CORDYLUS WARRENI DEPRESSUS (FitzSimons)

1930. *Zonurus barbertonensis depressus* FitzSimons, Ann. Transvaal Mus., **14**, pp. 24, 29: Newgate Farm, near Louis Trichardt, Zoutpansberg Mountains, northern Transvaal.

1935. Lawrence, p. 43.

Description. Head slightly depressed; head shields rugose; rostral in contact with the frontonasal, which is longer than broad; nostril pierced in the postero-inferior corner of a nasal which is not much swollen; a loreal; a preocular; median subocular descending to the lip between the fourth and fifth upper labials; fifth upper labial smallest, fifth not higher than others; prefrontals forming a suture; postfrontals longer than broad; interparietal on a line with the anterior parietals, forming a suture with the postfrontals; posterior parietals slightly larger than the anterior; 6 rugose, pointed occipitals; temporals rugose, keeled, the hindmost subtriangular, slightly curved and bluntly

pointed; sides of neck with large, sharp, erect spines; gulars small, the anterior irregularly enlarged, the median not imbricate, smooth, or the lateral obtusely keeled; collar scales enlarged, keeled, the lateral mucronate.

Dorsals subquadrangular, rugose, strongly keeled, lateral scarcely mucronate, the two vertebral rows reduced; laterals keeled, spinose, separated by granular interspaces; ventrals quadrangular, smooth, not or but slightly imbricate, the lateral obtusely keeled but not shortly mucronate; scales below fore limbs keeled, below hind limbs smooth or obtusely keeled; tail with whorls of large, rugose, strongly keeled but not serrate, spinose scales, alternating with whorls of smaller scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9, for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown flecked with yellow; back brown with yellow spots forming more or less regular transverse series. Below, yellowish with brown infuscations.

Size. Total length of ♀ paratype (M.C.Z. 41869), 250+ (120 + 130+) mm. Both paratype ♂ and type ♀ had the same body length but the tails in all six of the type series were damaged.

Remarks. Its describer states that *depressus* differs from *barbertonensis* in having the "head considerably more depressed and rugose: occipital spines not so elongate and subequal: dorsal scales larger and more rugose: lateral spines on tail shorter and sturdier, directed outwards at greater angle: scales on palms of hands and soles of feet larger and thus fewer in number."

I must confess that, having compared our aged and worn paratype of *depressus* with a topotype of *barbertonensis*, the only differences that I can detect are those affecting the dorsals and possibly some slight difference in scales on "palms" and soles.

Breeding. Early in July (midwinter) three of the four females held eggs, the oviduct of one containing "two large undeveloped eggs." (FitzSimons).

Diet. All were emaciated, probably due to being taken in midwinter.

Parasites. Mites (*Zonurobia transvaalensis*) were described from this race by Lawrence.

Habitat. Occurs between 4800 to 5000 feet on the Zoutpansberg, in or near rock crevices caused by weathering.

Localities. **Transvaal:** Newgate Farm near Louis Trichardt.

Range. Transvaal (Zoutpansberg Mountains).

CORDYLUS WARRENI LAEVIGATUS (FitzSimons)

Plate 2, fig. 2

1933. *Zonurus laevigatus* FitzSimons, Ann. Transvaal Mus., 15, p. 276, figs. 1-2: Entabeni, Zoutpansberg Mountains, northern Transvaal.
1935. Lawrence, p. 43.

Description. Head slightly depressed; head shields slightly rugose; rostral in contact with the frontonasal, which is as long as broad; nostril pierced in the postero-inferior corner of a nasal which is not much swollen; a loreal; a preocular; median subocular descending to the lip between the fourth and fifth upper labials; fifth upper labial smallest and not higher than others; prefrontals forming a suture; postfrontals longer than broad; interparietal on a line with the anterior parietals, forming a suture with the postfrontals; posterior parietals much larger than the anterior; 6 rugose, pointed occipitals; temporals rugose, keeled, the hindmost subtriangular, slightly curved and bluntly pointed; sides of neck with a few large, sharp, erect spines; gulars small, the anterior irregularly enlarged, the median not imbricate, smooth, or the lateral almost imperceptibly keeled; median collar scales enlarged, smooth, the lateral keeled, mucronate.

Dorsals subquadrangular, finely rugose, keeled, the two vertebral rows reduced; laterals keeled, spinose, separated by granular interspaces; ventrals quadrangular, the median smooth, not imbricate, the lateral obtusely keeled and shortly mucronate; scales below fore limbs keeled, below thigh smooth, below tibia, obtusely keeled and mucronate; tail with whorls of large, rugose, strongly keeled but not serrate, spinose scales, alternating with whorls of smaller scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9, for scale and pore counts, see statistical table on p. 15.

Color. Above, head and body dark brown sparsely spotted with yellow. Below, slightly paler, gular region with darker infuscations.

Size. Total length of ♀ type (T.M. 14229) 226 (116 + 110) mm.

Remarks. Its describer states that *laevigatus* may be readily distinguished from *barbertonensis*, *vandami*, and *breyeri* by "its much slighter build and pronounced reduction of the rugosity and spinosity of the scales generally." Having seen neither of the females on which this form was based, I can only add that the grounds of separation appear slender. FitzSimons (1943) continues to regard it as a full species.

Parasites. Mites (*Zonurobia transvaalensis*) were described from this race by Lawrence.

Habitat. Occurs between 5000 and 6000 feet on the Zoutpansberg, beneath loose stones and in rock crevices.

Localities. **Transvaal:** Entabeni.

Range. Transvaal (Zoutpansberg Mountains).

CORDYLUS WARRENI BREYERI (van Dam)

Plate 2, fig. 3

- 1921a. *Zonurus breyeri* van Dam, Ann. Transvaal Mus., 7, p. 239, pls. i-ii:
Geelhoutkop Farm, about 45 miles north of Nylstroom, Waterberg
District, northwestern Transvaal.
1930. FitzSimons, p. 29.
1930. Power, p. 14.
1935. Lawrence, p. 44.
1937. Lawrence, p. 111.

Description. Head slightly depressed; head shields rugose; rostral in contact with the frontonasal, which is as long as broad; nostril pierced in the postero-inferior corner of a nasal which is not much swollen; a loreal; a preocular; median subocular descending to the lip between the fourth and fifth upper labials; fifth upper labial smallest, fifth not higher than others; prefrontals forming a suture; postfrontals about as long as broad; interparietal on a line with the anterior parietals, forming a suture with, or separated from, the postfrontals; posterior parietals slightly larger than the anterior; 6 rugose, pointed occipitals; temporals rugose, keeled, the hindmost subtriangular, slightly curved and bluntly pointed; sides of neck with large, sharp, erect spines; gulars small, the anterior irregularly enlarged, the median not imbricate, smooth, or the lateral obtusely keeled; collar scales enlarged, the lateral keeled and mucronate.

Dorsals subquadrangular, rugose, strongly keeled, lateral shortly mucronate, the two vertebral rows reduced; laterals keeled, spinose, separated by granular interspaces; ventrals quadrangular, the median smooth, not or but slightly imbricate, the lateral obtusely keeled but not imbricate; scales below fore limbs keeled, below thigh smooth or obtusely keeled, below tibia, keeled; tail with whorls of large, rugose, strongly keeled but not serrate spinose scales, alternating with whorls of smaller scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9, for scale and pore counts, see statistical table on p. 15.

Color. Above, head brownish black; back brown; flanks yellowish brown; tail grayish brown. Below, slate gray; tail slightly lighter than above.

Size. Total length of ♀ type (T.M. 3769), 275 (120 + 115) mm.

Remarks. Its describer contrasted *breyeri* with *giganteus* from which it differs greatly in many respects, specifically in the presence of alternating whorls of smaller scales on the tail in the entire *warreni* group.

The typical form is known only from the adult type, three subadult lizards, and six foetal young. The latter (*circa* 90 mm.) are said to differ from the adult in the head shields being smooth; occipitals only keeled, not sharply pointed; median as well as lateral dorsals strongly keeled; smaller whorls of caudal scales distinctly visible from above, but not on the sides and below where they are hidden by the spines.

Breeding. In January the gravid type was found to contain 6 young, the largest measuring 90 mm.

Parasites. Mites (*Zonurobia circularis latior*) were described from this race by Lawrence.

Habitat. Occurs at about 5000 feet in Waterberg District, among rocks.

Localities. **Transvaal:** Geelhoutkop Farm.

Range. Transvaal (Waterberg Mountains).

CORDYLUS CAERULEOPUNCTATUS (Methuen & Hewitt)

Plate 3, fig. 3

- 1913c. *Zonurus caeruleopunctatus* Methuen & Hewitt, Trans. Roy. Soc. S. Africa, **3**, p. 110: Buffel's Nek, between Knysna and Avontuur, Cape Province.
- 1914a. Hewitt, p. 239.
1925. Essex, p. 339.
- 1928a. Essex (1927), p. 932.
1930. FitzSimons, p. 29.
1930. Power, p. 13, pl. ii, fig. 2.
1935. Lawrence, p. 44.
1937. Lawrence, pp. 109, 111.

Description. Head slightly depressed; head shields smooth anteriorly, slightly rugose posteriorly; rostral in contact with, or separated from, the frontonasal, which is shorter than broad; nostril pierced in the lower centre of a nasal which is not much swollen; a loreal; a

preocular; median subocular descending to the lip between the fourth and fifth upper labials; fourth upper labial lowest, fifth higher than others except first; prefrontals forming a suture, or separated; postfrontals as long as broad; interparietal enclosed between 2 pairs of parietals; posterior parietals much larger than the anterior; *no occipitals*; anterior nuchals very small; temporals large, rugose, keeled, without spines; sides of neck with keeled scales; gulars moderate, the anterior irregularly enlarged, the median not imbricate, smooth; collar scales larger but undifferentiated.

Dorsals elongate, strongly keeled, a few shortly mucronate, posteriorly serrate, the two vertebral series enlarged; laterals elongate, keeled; ventrals quadrangular, smooth, not or but slightly imbricate; scales below fore limbs keeled, below hind limbs smooth or obtusely keeled; tail with whorls of large, strongly keeled, slightly mucronate and serrate scales above and below, the subcaudals being long, narrow, pentagonal, keeled.

For characters common to all species, see definition on p. 9, for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown; back blackish brown variegated anteriorly with irregular, longitudinal, fawn-colored stripes; sides of head and flanks flecked with bright blue. Below, gular region orange (white in alcohol); belly greenish white to bluish; tail brownish.

Size. Total length of type (T.M. 1920) 150+ (65 + 85+) mm., of another (from Power Siding) 182 (72 + 110) mm.

Remarks. The describers suggest that this lizard is related to *warreni* and *capensis* (now in *Pseudocordylus*). Power (1930) thinks to *cordylus*. It differs from all other members of the genus in lacking *occipitals* and in the greatly reduced nuchals, both characters apparently demonstrating affinities with *Pseudocordylus* with which it also agrees in lacking osteoderms.

Parasites. Mites (*Ixodiderma inverta* and *Zonurobia sanguinea*) were found by Lawrence.

Temperament. When basking in the sun this lizard is extremely difficult to catch. Of thirty lizards counted on a mile-long wall only three were captured (Essex). Its eyesight appears abnormally keen making it difficult to approach even within shooting distance of one of these lizards (Lawrence).

Habitat. Among rocks on a mountain within the Cape Flora vegetational zone, no forest being present.

Localities. **Cape Province:** Buffel's Nek between Avontuur and Knysna; Montagu Pass, Outeniqua Mountains; Power Siding,

halfway up Montagu Pass; Prince Alfred's Pass, Outeniqua Mountains; Silver River between George and the Wilderness.

Range. Cape Province (Outeniqua Mountains and vicinity).

CORDYLUS VITTIFER (Reichenow)

1887. *Zonurus vittifer* Reichenow, Zool. Anz., **10**, p. 372: Transvaal.
 1891a. Matschie, p. 606.
 1894e. Boulenger, p. 724.
 1898. Sclater, p. 104.
 1908b. Boulenger, p. 224.
 1909a. Hewitt, pp. 31, 37.
 1910a. Hewitt, p. 56.
 1911b. Hewitt, p. 74.
 1911b. Sternfeld, p. 401.
 1911c. Sternfeld, p. 419.
 1911d. Sternfeld, p. 21, fig. 20.
 1914a. Hewitt, p. 239.
 1921a. Dam, p. 242.
 1927c. Power, p. 407.
 1930. FitzSimons, p. 30.
 1935. Broom, p. 20, fig. 5b.
 1935. Lawrence, p. 44.
 1889. *Zonurus cordylus* Boettger (not Linné), p. 287.
 1910b. Boulenger (part), p. 468.
 1907b. *Zonurus cordylus* var. *vittifer* Roux, p. 418.
 1908. Odhner, p. 3.
 1930. Power, p. 17.
 1931. Power, pp. 41, 48. (as *vettifer* also).
 1910b. *Zonurus tropidogaster* Boulenger, Ann. S. African Mus., **5**, pp. 468, 495: Barberton, Transvaal.
 1911b. Hewitt, p. 47.
 1930. Power, p. 15.

Further citations of "*vittifer*" will be found under *cordylus angolensis* and *c. tropidosternum*.

Description. Head much depressed; all head shields strongly rugose; rostral separated from the frontonasal, which is longer than broad, as long as broad, or sometimes absent¹; nostril pierced in the postero-inferior corner of a large nasal which is not much swollen; a loreal present or absent²; a preocular; the median subocular not descending to the lip; fourth upper labial lowest, fifth highest; prefrontals forming

¹ In type of *tropidogaster* only.

² For example fused with preocular in M.C.Z. 41879-80.

a suture, or separated; postfrontals longer than broad, as long as broad, or shorter than broad; interparietal enclosed between 2 pairs of parietals or on a line with the anterior parietals separated from or forming a suture with the postfrontals; posterior parietals much larger than the anterior; 4-6 rugose, subequal occipitals; anterior row of nuchals *twice as large as the second*; temporals large, rugose, slightly keeled, without spines; sides of neck with keeled, spinose scales; gulars small, the anterior irregularly enlarged, the median slightly imbricate, smooth, or the laterals only obtusely keeled and even mucronate¹; collar scales larger but undifferentiated.

Dorsals elongate, rugose, keeled, very shortly mucronate, not or but slightly serrate, those on the vertebral line not or but rarely differentiated; laterals keeled, serrate, spinose; ventrals quadrangular, smooth or keeled², not or but slightly imbricate; scales below fore limbs keeled, below hind limbs smooth or slightly keeled; tail with whorls of large, strongly striate, keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown; back yellowish, yellowish brown, reddish brown, uniform or variegated or spotted with darker, a yellow vertebral line present or absent. Below, whitish, uniform. Color of young richer than that of adults.

Size. Total length of largest ♂ (M.C.Z. 12416) 172+ (83 + 89+) mm. (ex. Rhoodeplaat); and largest ♀ (M.C.Z. 21364) 160+ (82 + 78+) mm. (ex. Doornkop). The type (Berlin Mus.) was only 112 (55 + 57) mm., while the type of *tropidogaster* (Brit. Mus.?) was still smaller, having a length from snout to anus of only 48 mm.

Remarks. *Z. tropidogaster* Boulenger was based on a young lizard which lacked a frontonasal and possessed keeled ventrals. The latter condition has long been known to occur in occasional specimens of *vittifer* (Roux, 1907b) and such as a specimen from Zululand (M.C.Z. 45416) or Marieskop, Transvaal (M.C.Z. 41877), so that I entirely concur with Hewitt's (1911b, p. 147) suggestion that it is nothing but a synonym of *vittifer*. Such a view is reinforced by the occurrence of typical *vittifer* at Barberton, type locality of *tropidogaster*.

Tornier (1896), impressed by the similarities between *vittifer* and *cordylus* synonymized the former with the latter. Roux (1907b) on account of stable differences revived it as a variety. Hewitt (1909a)

¹ In M.C.Z. 41877.

² See *Remarks*.

rightly restored it to full specific rank on account of the constantly longer nasal suture, greatly enlarged first row of nuchals, and more numerous dorsals.

With regard to the latter, it is clear from the context that Roux's (1907b) counts of longitudinal dorsal rows *do not* include the laterals, whereas Sternfeld (1911b), in common with most recent authors, *does* include them. Had this been realized much unnecessary discussion might have been avoided. Monard's (1937b) suggestion that the Angolan *cordylus* of Bocage are referable to *vittifer* is untenable.

Anatomy. Broom (1935) discusses the temporal region of the skull.

Parasites. Mites (*Zonurobia circularis latior*) have been described from this species by Lawrence.

Habitat. Living under stones and in rocky crevices of kopjes (van Dam) chiefly in the low veld portions of the Transvaal (Hewitt), and one found at a height of four feet from the ground in a small tree at Lobatsi (Power).

Localities. **Bechuanaland:** Lobatsi (*vide* Power). **Transvaal:** Arnheimburg; Barberton; Belfast; Botschabelo near Middleburg; Carolina; Doornkop near Belfast; Entabeni; Frederikstad; Haenertsburg; Johannesburg; Koster; Krugersdorp; Linokana; Makapan; Marico; Mariepskop; Metlepetsi River; Middleburg District; Mphome (Mpoma), Zoutpansberg; Olifants River District; Orange Grove near Johannesburg; Pietersburg; Potgietersrust; Pretoria District; Roodeplaat; Rustenburg District; Selati; Shilowane; Wakkerstroom; Waterberg; Witwatersrand; Woodbush. **Zululand:** Mkusi River; Ubombo; Umfolosi Rivers junction. **Natal:** Lady-smith; Reitvlei, Umvoti; Weenen.

Range. Transvaal and adjacent areas in Bechuanaland, Swaziland, Zululand, and Natal. (Power (1930) includes: "Albany Division, Cape Province." It would seem probable that this was based on Hewitt's (1909a) record from Teafontein, near Grahamstown; a record which was later repudiated by Hewitt (1911b). Angola, based on Monard's suggestion, (*vide* Remarks *supra*), is also rejected.

CORDYLUS CORDYLUS RIVAE (Boulenger)

1896b. *Zonurus rivae* Boulenger, 1897, Ann. Mus. Civ. Stor. Nat. Genova (2), 17, p. 8: Giacorsa, Gallaland, Ethiopia.

1897g. Boulenger, p. 278.

Description. Head longer than broad; rostral separated from the frontonasal, which is longer than broad, nostril pierced in the "centre"

of a nasal which is not much swollen; a loreal; a preocular; prefrontals separated by frontonasal forming a suture with the frontal; temporals large, without spines; gulars small, keeled.

Dorsals strongly keeled, shortly mucronate; median ventrals smooth; the lateral obtusely keeled; preanals subequal (!); tails with whorls of large, strongly keeled, spinose scales above and below.

This scanty description is adapted from the original which might be consulted for further details; for scale and pore counts see statistical table on p. 15.

Color. Above, reddish brown, darker brown along the middle of the back and on the sides. Below, reddish brown.

Size. Total length of young holotype, 79 (39 + 40) mm. Length of head 13 mm.; width of head 10 mm.; length of body 26 mm.; of fore limb 15 mm.; of hind limb 19 mm.

Localities. **Ethiopia:** Gallaland: Giacorsa.

Range. Ethiopia (known only from the type locality).

CORDYLUS CORDYLUS TROPIDOSTERNUM (Cope)

Plate 3, figs. 2a-b

1869. *Zonurus tropidosternum* Cope, Proc. Amer. Philos. Soc., 11, p. 169:
"Madagascar" (presumed error for Mozambique).
- 1881c. Boettger, p. 528.
- 1885e. Boulenger, p. 254.
1896. Tornier, p. 31.
1897. Tornier, p. 64.
1898. Tornier, p. 285.
- 1900b. Tornier, p. 590.
1909. Mocquard, p. 4.
1913. Boettger, pp. 360, 361.
- 1913c. Nieden, p. 71.
- 1920a. Loveridge, p. 143.
- 1923d. Loveridge, p. 849.
- 1923h. Loveridge, p. 947.
- 1924b. Loveridge, p. 10.
1928. Cott, p. 953.
- 1936j. Loveridge, p. 296.
- 1937f. Loveridge, pp. 492, 495.
- 1939b. FitzSimons, p. 29.
- 1942e. Loveridge, p. 330.
1889. *Zonurus frenatus* Pfeffer, Jahrb. Hamburg, Wiss. Anst. 6, p. 6:
Mhonda, Tanganyika Territory.
1893. Pfeffer, p. 73, pl. i, figs. 1-2.

1896. *Zonurus* spec. ? *cordylus*, ? *vittifer* Tornier, p. 35 (Potuë).
 1897. Tornier, p. 64.
 1897e. *Zonurus cordylus* Boulenger (not Linné), p. 800 (Nyasaland).
 1898. Tornier, p. 285, fig. 4.
 1898. Johnston, p. 361.
 1902b. Tornier, p. 590.
 1934. Pitman, p. 304.
 1934a. *Zonurus parkeri* Cott, Proc. Zool. Soc. London, p. 151, pl. ii: Amatongas, Mozambique.
 1937d. *Cordylus tropidosternum* Mertens, p. 5.

Names. Eastern Girdle-tail (English); *kiumambusi* (Swahili: Tornier); *chicologolo* (Mwera: Loveridge).

Description. Head slightly depressed; head shields strongly rugose; rostral in contact with, or separated from, the frontonasal, which is longer than broad; nostril pierced in the postero-inferior corner of a large nasal which is not much swollen; a loreal; a preocular; the larger subocular not descending to the lip; fourth upper labial lowest, fifth highest; prefrontals forming a suture or separated; postfrontals longer than broad or as long as broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 3-4 rugose, subequal occipitals; temporals rugose, with or without keels, without spines; sides of neck with keeled, spinose scales; gulars small, the anterior irregularly enlarged, the median slightly imbricate, keeled; collar scales larger, sometimes mucronate.

Dorsals slightly elongate, rugose, strongly keeled, shortly mucronate, posteriorly serrate, those on the vertebral line not or but slightly differentiated; laterals keeled, spinose, scarcely separated by minute granular interspaces; ventrals quadrangular, smooth or keeled, not or but slightly imbricate; scales below fore and hind limbs slightly keeled; tail with whorls of large, strongly striate, keeled, serrate (in adults, but noticeably in young), spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head dark brown, lip to ear usually yellow; back yellowish, yellowish brown, reddish brown, grayish brown, blackish brown or rich brown, uniform or clouded, variegated, or spotted with darker; a broad blackish streak on side of neck from above tympanum to forearm, sometimes persisting as a distinct (Rhodesia) or ill-defined (Tanganyika) lateral band. Below, uniform greenish, grayish, yellowish, or reddish (stained by laterite soil) white.

Size. Total length of ♂, 180 (90 + 90) mm., and ♀, 170 (95 + 75) mm., both from Morogoro. The head and body length of the types are: 92 mm. (*tropidosternum*), 70 mm. (*frenatus*), and 92 mm. (*parkeri*), the tails being damaged in the two largest.

Remarks. The type, formerly Museum of the Essex Institute No. 500, now Mus. Comp. Zoöl. 5742, is apparently a ♂ but it is somewhat macerated and the viscera have been removed. Mocquard (1909, p. 4) was correct in eliminating *tropidosternum* from the Malagasy herpetofauna. Hewitt (1910a) also discusses the matter, but takes a contrary view. If actually taken on the island, its presence may be readily explained by the extensive dhow trade across the Mozambique channel, this species being subject to transportation in hollow logs which have been cut for fuel.

In this connection it is interesting to note that Cope's type bears a closer resemblance to the series from Birchenough Bridge, Southern Rhodesia, than it does to Tanganyika lizards. I have spent much time in endeavouring to find other than color characters by which to separate the Tanganyika lizards (for which the name *frenatus* would be available), but the differences appear too slight to justify such action. I might say, however, that *parkeri* of Mozambique, which allegedly differed from *tropidosternum*, is definitely a synonym of that race. Elsewhere I (1936j) have discussed in detail the relative lengths of fingers and toes and other variable characters employed by Cott for the separation.

In Cott's paratype of *parkeri*, though not in the type, and in five of the eight specimens taken at Birchenough Bridge by FitzSimons, the prefrontals were separated by the frontonasal being in contact with the frontal. Tornier's (1896) error of dividing Tanganyika material on the basis of rostral being in contact with, or separated from, the frontonasal by a suture of the nasals, was later corrected by Nieden (1913c). More recently Mertens (1937d) has invited attention to minor differences exhibited by his six lizards from Matete Woods.

Breeding. On July 28, at Makindu, I took a ♀ which held 4 large eggs. Tornier found 5 embryos in a ♀, apparently from Dar es Salaam but without date.

Diet. Each of four stomachs examined held termites, a glowworm fell from the mouth of a fifth, while a captive lizard fed readily on small grasshoppers.

Parasites. The nematode worm (*Oochoristica zonuri*) described as from this species, actually came from a *Gerrhosaurus m. major*, the error in labeling it in 1918 was mine.

Enemies. Their spines do not offer perfect protection for I recovered one from the stomach of a Bare-faced Hawk (*Gymnogenys t. typicus*), while another was caught and eaten by a young galago (*Galago c. panganiensis*) which had been temporarily put in the vivarium.

Habitat. Coastal zone and upland savanna, where they are found upon hollow trees into whose interiors they retreat and from which it is difficult to dislodge them. One was actually brought into camp in a hollow log—in which she had remained while it was being chopped down—and did not even show herself when the log was roughly flung down. Three were taken from holes in the base of a wall. Two others, after torrential downpours, were found in roadside gutters in a half-drowned condition, having evidently been washed out of some retreat. One was caught running over papers on the table in my tent. In East Africa the species may generally be considered scarce except perhaps at Morogoro where eleven were taken during a year.

FitzSimons (1939b), who took eight specimens at Birchenough Bridge, found them living in the rotted-out cavities of mopane trees.

Localities. **Kenya Colony:** Sokoki Forest. **Tanganyika Territory:** Dar es Salaam; Kakoma; Kipera; Makindu, Msiha River; Matete; Mhonda; Morogoro; Msimba; Nchingidi, Rondo Plateau; Pentambili; Potuë, Usambara district; Rufigi; Tendaguru; Unyika; Usaramo. **Mozambique:** Amatongas. **Nyasaland.** **Southern Rhodesia:** Birchenough Bridge.

Range. Kenya Colony (near Malindi) south through Tanganyika, Mozambique, and Nyasaland to Southern Rhodesia (where it meets with *C. c. jonesii* and *C. c. rhodcsianus*).

CORDYLUS CORDYLUS JONESII (Boulenger)

Plate 3, fig. 3

- 1891d. *Zonurus Jonesii* Boulenger, Ann. Mag. Nat. Hist. (6) 7, p. 417:
Murchison Range, northeast Transvaal.
- 1894e. Boulenger, p. 724.
1895. Jeude, p. 228 (as *Johnesii*).
1898. Selater, p. 103.
- 1907j. Boulenger, p. 484.
- 1907b. Roux, p. 420.
- 1909b. Chubb, p. 35.
- 1909a. Hewitt (part), pp. 31, 36 (omit Steynsburg and Vitenhage).
- 1910b. Boulenger, p. 468.
- 1910a. Hewitt, pp. 56, 60.

- 1911b. Hewitt, p. 47.
 1913. Hewitt & Power, p. 153.
 1914a. Hewitt, p. 239.
 1921a. Dam, p. 243.
 1927c. Power, p. 407.
 1930. FitzSimons, p. 29.
 1934. Pitman, p. 304.
 1935. Lawrence, p. 44.
 1892a. *Zonurus cordylus* Boulenger (not Linné), p. 174.
 1909a. Chubb, p. 593.
 1930. *Zonurus cordylus jonesii* Power, p. 16, pl. i, fig. 3.
 1931. Power, p. 48.
 1933a. Hewitt, p. 48.
 1935b. FitzSimons, p. 349.

Description. Head slightly depressed; all head shields strongly rugose; rostral rarely in contact with, usually separated from, the frontonasal, which is longer than broad or as long as broad; nostril pierced in the lower center of a large nasal which is not much swollen; a loreal present or absent; a preocular; the larger subocular not descending to the lip; third or fourth upper labial lowest, fourth or fifth highest; prefrontals forming a suture or separated; postfrontals longer than broad or as long as broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 4 rugose, subequal occipitals; temporals rugose, without keels or spines; sides of neck with keeled, spinose scales; gulars small, the anterior irregularly enlarged, the median slightly imbricate, smooth or feebly keeled; collar scales larger but undifferentiated.

Dorsals slightly elongate, rugose, strongly keeled, shortly mucronate, posteriorly serrate, those on the vertebral line not or but rarely differentiated; laterals keeled, spinose; ventrals quadrangular, smooth, not or but slightly imbricate; scales below fore limbs keeled, below hind limbs smooth; tail with whorls of large, strongly striate, keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown, lip to ear yellow; back yellowish brown, olive brown, or reddish brown, uniform or spotted with darker; from tympanum to groin a black, brown, or reddish lateral band. Below, whitish, uniform.

Size. Total length of ♂ type (Brit. Mus.) 118* (67 + 51+) mm.; a perfect ♂ (M.C.Z. 14212), 124 (70 + 54) mm.; length from snout to

anus of largest ♂ (FitzSimons) and ♀ (M.C.Z. 20990), 73 mm., both having lost their tail tips.

Remarks. Hewitt (1909a), furnishing actual measurements, shows that the heads of adult *c. jonesii* are much less depressed than those of *c. cordylus*, but adds that the distinction is not so obvious in young individuals. In *c. jonesii* the head shields are strikingly rugose in comparison with the much smoother ones of *c. cordylus*.

Hewitt's (1933a) suggestion, however, that Bulawayo lizards should probably be referred to *c. rhodesianus*, is not approved by FitzSimons (1935b) nor confirmed by our single Bulawayo specimen.

Parasites. Mites (*Zonurobia circularis* var.) were found by Lawrence.

Habitat. Found among the cracks and crevices of dolomite kopjes (Power). Beneath the bark of a dead tree and within the hollow trunk of a living one (van Dam). Under loose bark of tree growing in Kalahari sand veld; among dead wood of mopane forest; on a fence in the middle of Bulawayo (FitzSimons).

Localities. **Mozambique:** Mozambo, Limpopo River. **Southern Rhodesia:** Bulawayo; Empandeni; Lundi River; Matopo Hills. **Bechuanaland:** Devondale; Kuke to Molepole; Lobatsi; Mmoove 42 miles from Serowe; Palapye; Titumi (Totomi) near Bushman Mine. **Transvaal**¹: Bridgewater; Crocodile-Komati River junction; Geelhoutkop; Griffin Mine near Leydsdorp; Haenertsburg; Hectorspruit; Hornsnek; Leydsdorp; Limpopo River; Louis Trichardt; Lydenburg; Magalakwin River; Maiepo c. 25 miles N. of Gravelotte; Makoetsi River; Murchison Range; Olifants River District; Pongola River; Potgietersrust; Pretoria District; Rustenburg; Selati; Shiny c. 28 miles E. of Gravelotte; Silwane; Waterberg District; Wilhanshohe; Zoutpansberg District. **Cape Province:** Kimberly (introduced).

Range. Southern Mozambique and Southern Rhodesia (Bulawayo south) and Bechuanaland (eastern Kalahari) through Transvaal. Also Cape Province (at Kimberly where it has been artificially introduced).

CORDYLUS CORDYLUS ANGOLENSIS (Bocage)

?1869b. *Zonurus griseus* Peters (not Cuvier), p. 659 (Damaraland).

?1885e. *Zonurus cordylus* Boulenger (part, not Linné), p. 256 (Damaraland).

?1895a. Bocage, p. 24 and footnote p. 25 (Angola).

¹ Specimens from Johannesburg and Krugersdorp listed under *cordylus* by Boulenger (1910b), are all *villifer* according to FitzSimons (letter of March, 1943).

- ?1897b. Boulenger, p. 277 (Aruwimi, Belgian Congo).
 ?1911d. Sternfeld, p. 21 (Damaraland).
 1895a. *Zonurus angolensis* Bocage, Herp. Angola et Congo, p. 25: Caconda, Angola.
 1930. Power, p. 16.
 1937b. Monard, p. 61.
 ?1937b. *Zonurus vittifer* Monard (not Reichenow), p. 61.

Description. Nostril pierced in the postero-inferior corner of a nasal which is not much swollen; a loreal; a preocular; prefrontals forming a suture or separated; gulars noticeably smaller than those of *cordylus*, imbricate, smooth or keeled.

For scale and pore counts see statistical table on p. 15.

Color. Above, head and back brown, a double series of small, irregular, whitish spots along the back; tail barred with brown. Below, whitish with darker infuscations.

Size. Total length of ♂ type, 152+ (74 + 78+) mm.

Remarks. This form is known to me only from Bocage's description, based on characters which are variable in typical *cordylus*; in a footnote Bocage adds that he has two other Angolan specimens lacking precise locality, which he considers are quite typical *cordylus*. The scanty description furnished above, together with figures in the statistical table, are composite of the data furnished by Bocage for all three (*cordylus* + *angolensis*) of his Angolan lizards.

Peters (1869b) merely lists *griscus* without comment so it is impossible to say what he had. Boulenger's (1885e) Damaraland male would presumably be of the same form as Peters', while the later (1910b) example from Walfish Bay was collected by Nightingale. Hewitt (1911b) casts doubt on this record for Nightingale was also credited with taking *Oedura africana* in the same locality though the species is otherwise unknown from South West Africa.

Boulenger's (1897b) lizard from Aruwimi may be *angolensis* or else an undescribed form, it certainly would not be typical *cordylus*. Power (1930) remarks that *angolensis* is relegated to the synonymy of *C. c. jonesii* in the Zoological Record, this disposition is improbable but should receive attention when specimens are available. Monard (1937b) refers the two Bocage ("*cordylus*") without locality to *vittifer*.

Localities. ? **South West Africa:** Damaraland. **Angola:** Caconda. ? **Belgian Congo:** Aruwimi River.

Range. ? Northern South West Africa through Angola to the north-central Belgian Congo?

CORDYLUS CORDYLUS RHODESIANUS (Hewitt)

- 1933a. *Zonurus cordylus rhodesianus* Hewitt, Occ. Papers Rhodesian Mus., p. 48, pl. ix, fig. 3: Monte Cassino, Macheke, Southern Rhodesia.
 1935. Lawrence, p. 43.
 1939b. FitzSimons, p. 30.

Description. Head much depressed; head shields strongly rugose; rostral separated from the frontonasal, which is longer than broad or as long as broad; nostril pierced in the lower centre of a large nasal which is not much swollen; a loreal; a preocular; median subocular not descending to the lip; fourth upper labial lowest, fifth highest; prefrontals forming a suture or separated; postfrontals as long as broad or shorter than broad; interparietal enclosed between 2 pairs of parietals; posterior parietals much larger than the anterior; 4-6 rugose; subequal occipitals; temporals rugose, keeled, without spines; sides of neck with keeled, spinose scales; gulars moderate, the anterior irregularly enlarged, the median slightly imbricate, smooth, the lateral elongate; collar scales larger but undifferentiated.

Dorsals slightly elongate, rugose, strongly keeled, shortly mucronate, posteriorly serrate, those on the vertebral line slightly smaller; laterals keeled, serrate, spinose; ventrals quadrangular, smooth not or but slightly imbricate; scales below fore limbs keeled, below hind limbs smooth or slightly keeled; tail with whorls of large, strongly striate, keeled, serrate spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown, lip to ear yellow; back yellowish or olive brown variegated, spotted, or longitudinally streaked, with darker, these markings tending to form irregular cross-bars in young; tail uniform olive brown. Below, whitish, uniform.

Size. Length of ♂ type (Albany Mus.) from snout to anus, 82 mm.; of a ♀ (T.M. 18526) from snout to anus, 80 mm., both having injured tails; total length of a young one (M.C.Z. 44422), 69 (38 + 31) mm. Both of latter being from Vumba Mountain.

Remarks. As indicated by its describer, this form occupies a somewhat intermediate position between *vittifer* and *c. jonesii*, agreeing with *vittifer* in its much depressed head, and in having the anterior row of nuchals slightly more enlarged than is the case with any other race of the *cordylus* group. It differs from *c. jonesii* in that its anterior pair of sublabials form a long (not short) median suture, and in lacking a

dark lateral band. It differs from *c. cordylus* (but scarcely or not from *jonesii*) in that its anterior gulars form a slightly enlarged group, yet scarcely so enlarged as to be called sublinguals, while the majority of the gulars are longitudinally elongate (not transversely broadened).

Originally based on 8 lizards, one of which is now M.C.Z. 33448, this form was not again reported until 10, four of which are M.C.Z. 44419-22, were captured by FitzSimons on Vumba Mountain.

Habitat. Occurs at 5000 feet on Vumba Mountain, among rocks.

Localities. **Southern Rhodesia:** Monte Cassino; Macheke; Triashill Mission, Rusape; Vumba Mountain.

Range. Southern Rhodesia (*C. c. jonesii* also occurs but in the south-west at Bulawayo).

CORDYLUS CORDYLUS LAWRENCI (FitzSimons)

Plate 4, fig. 1

1937d. *Zonurus peersi* Hewitt (not Hewitt, 1932), p. 208.

1939a. *Zonurus lawrenci* FitzSimons, Ann. Transvaal Mus., 20, p. 7, figs. 2-4: Lekkersing, Richtersveld, Little Namaqualand.

Description. Head much depressed, longer than broad; head shields strongly rugose; rostral separated from the frontonasal, which is shorter than broad; nostril pierced near the centre of a large nasal which is not much swollen; a loreal; a preocular; median subocular not descending to the lip; fourth upper labial lowest, fifth highest; prefrontals forming a suture; postfrontals as long as broad or shorter than broad; interparietal enclosed between 2 pairs of parietals; posterior parietals subequal to the anterior; 4 strongly keeled, unequal occipitals; temporals strongly keeled, the hindmost serrated posteriorly and almost covering ear; sides of neck with keeled, spinose scales; gulars large, the anterior irregularly enlarged the median slightly imbricate, smooth, or the laterals feebly keeled.

Dorsals squarish, not rugose, strongly keeled, shortly mucronate, posteriorly finely serrate, the two vertebral rows scarcely enlarged; laterals in vicinity of midbody as large as the dorsals, keeled, strongly serrate, spinose; ventrals quadrangular, smooth, not or but slightly imbricate; scales below fore limbs keeled, below thigh smooth or slightly keeled, below tibia keeled and mucronate; tail with whorls of large, strongly keeled, serrate, spinose scales above and below.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head black, posteriorly flecked with yellow; back dark brown, anteriorly flecked with yellow; flanks, limbs, and tail paler than dorsum. Below, gular region grayish, reticulately spotted with blackish; belly grayish; tail straw yellow.

Size. Total length of ♀ type (S.A.M. 18553), 151 (67 + 84) mm.

Localities. **Cape Province:** Little Namaqualand: Lekkersing.

Range. Little Namaqualand, Cape Province (known only from the type).

CORDYLUS CORDYLUS TASMANI (Power)

Plate 4, fig. 2

1909a. *Zonurus jonesii* Hewitt (part, not Boulenger), p. 36.

1930. *Zonurus cordylus tasmani* Power, Ann. Transvaal Mus., 14, pp. 12, 16, pl. i, fig. 4: Dunbrody, Uitenhage Division, Cape Province.

1930. FitzSimons, p. 29.

1935. Lawrence, p. 43.

1937e. Hewitt, p. 30.

Description. Head much depressed; head shields strongly rugose; rostral separated from the frontonasal, which is longer than broad or shorter than broad; nostril pierced in the postero-inferior corner of a large nasal which is not much swollen; a loreal; a preocular; median subocular not descending to the lip; fourth upper labial lowest, fifth highest; prefrontals forming a suture or separated; postfrontals as long as broad or shorter than broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 5-6 rugose, subequal or irregular occipitals; temporals rugose, keeled, without spines; sides of neck with keeled, spinose scales; gulars moderate and large, the anterior irregularly enlarged, the median slightly imbricate, smooth, the lateral strongly keeled; collar scales larger but undifferentiated.

Dorsals squarish, rugose, strongly keeled, shortly mucronate, posteriorly serrate, the two vertebral rows enlarged; laterals in vicinity of midbody as large as the dorsals, keeled, serrate, spinose; ventrals quadrangular, smooth, not or but slightly imbricate; scales below fore limbs keeled, below hind limbs smooth or slightly keeled; tails with whorls of large, strongly striate, keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown, lip to ear yellow; back yellowish brown

or olive brown, spotted or longitudinally streaked with black or with irregular blackish cross-bars. Below, whitish or olive yellow, uniform.

Size. Total length of ♂ cotype (M.C.Z. 31572), 136 (70 + 66) mm.; of ♀ cotype (M.C.Z. 27122), 136+ (78 + 58+) mm., tail-tip missing.

Remarks. Its describer compares this race with *c. jonesii* with which it was said to agree in everything except larger laterals; it differs also in its more depressed head and in having 3 suboculars. Actually, as pointed out by Hewitt (1937d), it is more closely related to *c. cordylus* as one might expect from its distribution as a pocket within the range of the typical form.

This intermediate position is emphasized by the specimens from Steynsburg and Uitenhage in the Albany Museum, first referred to *c. jonesii* by Hewitt (1909a), and later (1911b) thought to be young *c. cordylus*, but which, according to Power (1930, p. 12) are more probably *c. tasmani*, and are therefore listed as such below.

Localities. Cape Province: Uitenhage Division: Dunbrody, Sunday's River; ? Steynsburg; Uitenhage.

Range. Uitenhage Division of Cape Province (surrounded by typical *C. c. cordylus*.)

CORDYLUS CORDYLUS MINOR FitzSimons

1943. *Cordylus cordylus minor* FitzSimons, Lizards of South Africa, p. 458:
Just north of Matjesfontein on road to Sutherland, Cape Province,
Union of South Africa.

Description. Head strongly depressed; head shields finely rugose throughout; rostral separated from the frontonasal, which is broader than long; nostril pierced in the postero-inferior corner of nasal, which is not swollen; a loreal; a preocular; 3 suboculars, the median not descending to the lip; 6 upper labials, sixth with a strongly compressed keel; 4 supraoculars, fourth smallest; 3 supraciliaries; no supranasals; prefrontals in contact; frontal longer than broad, broadest anteriorly; interparietal enclosed between 2 pairs of parietals, which are subequal or posterior pair slightly smaller than anterior; 6 (sometimes reduced and irregular) occipitals similar in size and shape to adjacent nuchals; temporals rugose and sharply keeled; "lower posterior temporal spine strongly compressed, with a sharp projecting edge"; sides of neck with keeled, spinose scales; 5 lower labials, posterior keeled, bordered by a row of 5 large shields; gulars moderate, the anterior irregularly enlarged, the median imbricate, smooth.

Dorsals squarish, rugose, strongly keeled, not or but shortly mucronate mesially, more strongly so dorsolaterally, posteriorly feebly serrate, and forming 24–26 longitudinal rows (inclusive of laterals on flanks) and 27–28 transverse rows; laterals subequal to dorsals; ventrals quadrangular, smooth, forming 16 regular longitudinal and 24–26 transverse rows; 2 enlarged preanals; limbs above with large, keeled, spinose, imbricate scales; 4–6 femoral pores with 1–2 rows of swollen, glandular scales anteriorly; tail with whorls of large, striate, strongly keeled, serrate, spinose scales above and below, the dorsolateral spines longest.

Color. Above, head dark brown to blackish faintly speckled with dull yellow; back and tail dull olive brown sparsely spotted with black. Below, grayish white tinged with olive yellow posteriorly and on tail.

Size. Total length of ♂ cotype (Tvl. Mus. 19563) 139 (65 + 74) mm.

Remarks. Known to me only from original description (based on six cotypes) which should be consulted for further details. Said to differ from *c. cordylus* in being “smaller in size, head and body more strongly depressed, head shields finely rugose throughout, body scales smaller and more strongly keeled and spinose, fewer femoral pores and subdigital lamellae.” That is 10–14 (usually 10–13) lamellae under fourth toe as against 13–17 in *c. cordylus*. In scale counts this new form apparently approaches the *pustulatus-namaquensis-campbelli* group.

Localities. Known only from the type.

Range. Vicinity of Matjesfontein, Cape Province.

CORDYLUS CORDYLUS CORDYLUS (Linné)

Plate 4, fig. 3

1758. *Lacerta cordylus* Linné, Syst. Nat. ed. 10, 1, p. 202: Africa.
 1760. Linné ed. 12, 1, p. 361: “Africa; Asia” (error).
 1900. Andersson, p. 7.
 1768. *Cordylus versus* Laurenti, Syn. Rept., p. 52: Africa.
 1802d. *Stellio cordylus* Daudin, p. 8.
 1829. *Cordylus dorsalis* Cuvier, Règne Animal, ed. 2, 2, p. 33: Africa.
 1829. *Cordylus griseus* Cuvier, Règne Animal, ed. 2, 2, p. 33: Africa.
 1838a. Smith, A., p. 31.
 1843. Smith, A., pl. xxviii, figs. 2–3; pl. xxx, figs. 8–8b.
 1884a. Rochebrune, p. 107 (omit Senegambia as error).
 1838. *Zonurus vertebralis* Gray, Ann. Nat. Hist., 1, p. 388: Cape of Good Hope.
 1839. *Zonurus griseus* Duméril & Bibron, p. 350.
 1845. *Zonurus cataphractus* Gray (not Boie), p. 47.

1845. *Zonurus cordylus* Gray, p. 47.
 1867a. Steindachner, p. 42.
 1885e. Boulenger (part), p. 256 (omit Damaraland?).
 1893a. Boettger, p. 66.
 1897. Bateman, p. 107.
 1898. Jeude, p. 21.
 1898. Werner (1896-7), p. 140.
 1898. Slater, p. 103.
 1907b. Roux (part), p. 417 (omit *niger* localities).
 1909a. Hewitt, p. 37.
 1910b. Boulenger (part), p. 468 (omit Transvaal, Natal and S. W. Africa records).
 1910a. Hewitt, pp. 60, 71.
 1910a. ?Werner, p. 324 (see Remarks under *C. namaquensis*).
 1911. Gilchrist, p. 230, fig. 15b.
 1911b. Hewitt, p. 47.
 1913. Hewitt & Power, p. 153.
 1913a. Werner, p. 107, fig.
 1914a. Hewitt, p. 239.
 1916. Andersson, p. 39.
 1920. Hewitt, p. 93.
 1921a. Dam, p. 242.
 1925. Essex, p. 338.
 1925b. Flower, p. 945.
 1926b. Rose, p. 492.
 1927b. Hewitt, p. 452.
 1928. Cott, pp. 927, 928.
 1928a. Essex (1927), p. 931.
 1929. Rose, p. 97, fig. 62.
 1931. Mann, pp. 390, 397, 399.
 1934a. Cott, p. 153.
 1935. Lawrence, p. 43.
 1937e. Hewitt, p. 29, pls. viii, fig. 4; x, fig. 4.
 1937. Lawrence, p. 107, fig. 1.
 1926b. *Zonurus cordylus flavus* Rose, Ann. S. African Mus., 20, p. 492: Robben Island, Cape Province, Union of South Africa.
 1930. *Zonurus cordylus cordylus* FitzSimons, p. 29.
 1930. Power (part), p. 16 (omit Umvoti).
 1936h. Loveridge, p. 58.

Further citations of "*cordylus*" and "*griseus*" will be found under *vittifer*, *c. tropidosternum*, *c. jonesii*, *e. angolensis*, *c. niger*, *ukingensis*, and *cataphraetus*.

Native names. Cape Girdle-tail (English); klip salamander (local misnomer); *uroqotyeni*.

Description. Head much depressed; head shields slightly (anteriorly) or strongly (posteriorly) rugose; rostral $2\frac{1}{2}$ (M.C.Z. 21570) to 4 (M.C.Z. 1940) times as broad as high, in contact with, or separated from, the frontonasal, which is longer than, or shorter than, broad, and sometimes divided (M.C.Z. 21567, 21570); nostril pierced in the postero-inferior corner of a moderate nasal which is not, or scarcely, swollen; a loreal; a preocular; 3 suboculars, the median not or but rarely descending to the lip between the fourth and fifth upper labials; 5-6 upper labials, fourth lowest, fifth highest; 3-4 supraoculars, the anterior longest, second broadest; 3 supraciliaries; no supranasals; prefrontals forming a broad or narrow suture, or separated; frontal pentagonal or hexagonal; postfrontals as long as broad or shorter than broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 4-5 rugose, subequal occipitals; temporals smooth or slightly rugose, keeled, without spines; side of neck with keeled, spinose scales; mental large; 5-6 lower labials, posterior largest and keeled, bordered by a row of 5 large shields; gulars moderate and large, the anterior irregularly enlarged, the median slightly imbricate, smooth, the lateral keeled, in 16-20 rows between angles of mandibles; collar scales larger but undifferentiated.

Dorsals squarish, slightly rugose, strongly keeled, shortly mucronate, posteriorly serrate, and forming 16-20 longitudinal rows (inclusive of laterals on flanks) and 25-29 transverse rows from occiput to base of tail; laterals like dorsals, keeled, serrate, spinose; a lateral fold; ventrals quadrangular, smooth not or but slightly imbricate, forming 12, rarely 10 or 14, regular longitudinal and 23-30 transverse rows between collar and anals; 2, rarely 4, enlarged preanals; limbs above with large, keeled, spinose, imbricate scales, below those on fore limbs keeled, on hind limbs smooth or slightly keeled; 6-9¹ femoral pores; tail with whorls of large, striate, strongly keeled, serrate, spinose scales above and below, the lateral spines longest.

Color. Above, head brown²; back yellowish olive, yellowish brown, olive brown, reddish brown, or blackish brown, uniform or variegated with darker, sometimes an irregular cream-colored vertebral line and a reddish lateral band present. The young are brown, or reddish brown, flecked with white. Below, greenish or yellowish white, uniform.

¹ 10-11 in a "South Africa" specimen (which agrees more nearly with *namaquensis*), *vide* Werner (1910a).

² Sometimes black, *vide* Rose (1926a).

Size. Total length of largest cotype (Stockholm Mus.), 170 (85 + 85) mm.; length of ♂ (M.C.Z. 21571) 166+ (84 + 82+) mm., of ♀ (M.C.Z. 21567), 158+ (84 + 74+) mm., their tails being injured, both surpassed by an unsexed specimen (Brit. Mus.) of 174 (84 + 90) mm.

Remarks. *Lacerta cordylus* was based on lizards figured in Seba, 1, pl. lxxxiv, figs. 3-4 from Africa and Cape of Good Hope respectively, and Seba, 2, pl. lxii, fig. 5 from Africa, called *Lacerta nigra* by Seba so probably the basis of what is now known as *C. c. niger* Cuvier. This can be settled as the probability of the five specimens now in the Royal Swedish Museum at Stockholm being the five cotypes from Drottningholm Museum is discussed by Andersson (1900).

Van Dam (1921a, p. 242) presents a table of characters in which *c. cordylus* differs from *vittifer*, though not all are valid. Later Hewitt pointed out that a median groove on the anterior portion of the frontal, almost always present in *c. cordylus*, is lacking in *c. niger*.

Anatomy. In a discussion of the branchial arch in lizards, Hewitt (1920) states that the epibranchials are present and that the hyoid has no relation with the ear. Mann (1931) remarks upon the structure of the eyes, which were described as being "reddish brown" by Sir A. Smith (1843).

Longevity. Three years, six months, ten days, in the London Zoological Gardens (Flower).

Breeding. Rose states that a single young one, two inches in length, is produced at a birth, but there are two ova, each measuring about 18 x 10 mm., in a ♀ (M.C.Z. 21410) from Grahamstown (N.D.).

Diet. Beetles, cockchafers, cockroaches, crickets and locusts (Hewitt). Though mainly insectivorous, this girdle-tail may at times be carnivorous, one having been seen to eat a young skink (*Mabuya* sp.), others to take scraps of preserved meat from a discarded tin, crumbs of currant cake, scraps of orange pulp, and even devour lichen from the rocks (Essex and Rose).

Parasites. Mites (*Scaphothrix convexa* and *Zonurobia cordylensis*) have been described from this race by Lawrence.

Enemies. One in stomach of a secretary bird (Andersson); "often a prey of kestrels" (Hewitt).

Habitat. The depressed form of this species facilitates its retreat into the crevices formed by cracks in the round boulders of dolerite abundant on the sides of the flat-topped mountains in the vicinity of Mortimer (Cott). In open country found beneath stones and rocks near which it basks until disturbed; on being alarmed it scuttles head first into its retreat so that the tail forms a protection for the body

(Hewitt). At times it lives, like *Gerrhosaurus*, in holes in the ground (Essex). Also occurs in dry logs and hollow stumps (Pannel in Hewitt) and will dash over or into shallow pools when frightened (Cronwright in Hewitt).

*Localities.*¹ **Cape Province:** Albany; Alexandria; Amatola Mountains; Bain's Kloof; Beaufort West; Bedford District; Bushman's River mouth; Cala; Cape St. Francis; Cape Town; East London; Fort Beaufort; French Kraal, Gaus Bay; Frenchhoek (Franschhoek); Gaika's Kop; George; Grahamstown; Hermanus; Hogsback; Hottentot's Holland Mountain; Houwhoek; Kalk Bay; Katberg summit; Kingwilliamstown; Kleinpoort near Committees; Kokstad; Knysna; Middleburg; Mitchel's Pass; Molteno; Montagu; Mortimer; Mossel Bay; Mount Ayliff; Mvenyane near Cedarville; Paarl; Philipstown; Port Alfred; Port Elizabeth; Queenstown; Robben Island; Sir Lowry's Pass; Somerset Strand; St. Croix Island; Stellenbosch; Steynsburg; Stutterheim; Swellendam; Tsomo, Transkei; Tulbagh District; Willowmore; Wynberg; Zuurberg, Alexandria Division.

Range. Chiefly coastal strip of Cape Province from Robben Island to East Pondoland. An isolated subspecies (*c. tasmani*) occurs within this range at Dunbrody just north of Port Elizabeth.

CORDYLUS CORDYLUS NIGER Cuvier

Plate 5, fig. 1

1735. *Lacerta nigra* Seba, Rerum naturalium Thesauri, **2**, p. 62, pl. lxii, fig. 5: Africa.
 1829. *Cordylus niger* Cuvier, Règne Animal, ed. 2, **2**, p. 33: Africa.
 1907b. *Zonurus cordylus* Roux (part, not Linné), p. 417.
 1926b. *Zonurus cordylus niger* Rose, p. 492.
 1929. Rose, p. 97, fig. 61.
 1930. *Zonurus cordylus atrus* Power, Ann. Transvaal Mus., **14**, pp. 11, 16, pl. i, fig. 2: Cape Peninsula, Cape Province.

Description. Head much depressed; head shields smooth or only slightly rugose; rostral separated from the frontonasal, which is as long as broad or shorter than broad; nostril pierced in the postero-

¹The Uitenhage record of Hewitt (1911b) is removed to *c. tasmani* by Power (1930), but apparently Hewitt (1937b) does not concur with Steynsburg being included in the transfer. Boulenger's (1910b) records of Johannesburg and Krugersdorp, Transvaal, and Umvoti, Natal are all *utitifer* according to FitzSimons (letter of March, 1943).

inferior corner of a moderate nasal which is not swollen; a loreal; a preocular; median subocular descending to the lip between the fourth and fifth upper labials; prefrontals forming a suture or separated; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 4, rarely 3, 5, or 6 smooth or slightly rugose, subequal occipitals; temporals smooth or slightly rugose, without spines; sides of neck with keeled, spinose scales; gulars moderate and large, the anterior irregularly enlarged, the median slightly imbricate, smooth; collar scales larger but undifferentiated.

Dorsals squarish, slightly rugose, strongly keeled, shortly mucronate; posteriorly serrate; laterals like dorsals, keeled, serrate, spinose; ventrals quadrangular, smooth, not or but slightly imbricate; scales below fore limbs keeled, below hind limbs smooth or slightly keeled; tail with whorls of large, striate, strongly keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, dull black, uniform. Below, black or gray, in young greenish white.

Size. Total length of ♂ (M.C.Z. 21555), 150 (67 + 83) mm., of ♀ (M.C.Z. 21573), 175 (85 + 90) mm.

Remarks. Apart from slightly smaller size, and color¹, *niger* differs from *c. cordylus* not only in the points mentioned in the key but in certain average characters such as averaging 10 (rarely 12, never 14) longitudinal rows of ventrals; head scales more or less smooth (not strongly rugose posteriorly); in having the scales of the occipital row smooth, rectangular, and similar to other head shields; in the vertebral series of scales being strongly keeled (not smooth).

Breeding. A single uniformly black young one produced at a birth (Rose).

Localities. **Cape Province:** Cape Peninsula: Cape Point; Cape Town; Muizenberg; Table Mountain (Range Cottage).

Range. Cape Peninsula (southern end from Cape Point to Muizenberg, meeting with the typical form in about equal numbers at Lion's Head).

¹ For causes of melanism in lizards see Parker, H. W., 1935, Proc. Zool. Soc. London, pp. 137-142.

CORDYLUS PEERSI (Hewitt)

Plate 5, fig. 2

1930. *Zonurus peersi* FitzSimons, p. 30 (*nomen nudum*).
 1932. Hewitt, Ann. Natal Mus., 7, p. 116, photo: Garies, Little Namaqualand, Cape Province, Union of South Africa.
 1935. Lawrence, p. 43.
 1937. Lawrence, p. 110.
 1938. FitzSimons, p. 192.

Description. Head much depressed; head shields *very* strongly rugose; rostral separated from the frontonasal (by a granule in one cotype), which is as long as broad or shorter than broad; nostril pierced in the postero-inferior corner of a large nasal which is swollen; a loreal; a preocular; median subocular descending to the lip between the fourth and fifth upper labials; fourth upper labial lowest, fifth highest; prefrontals forming a suture, rarely separated; postfrontals as long as broad; interparietal enclosed between 2 pairs of parietals; posterior parietals subequal to the anterior; 4 rugose (but not keeled), subequal occipitals; temporals rugose, strongly keeled, without spines; sides of neck with keeled, spinose scales; gulars moderate and large, the anterior *not* irregularly enlarged, the median slightly imbricate, smooth or obtusely keeled; collar scales larger but undifferentiated.

Dorsals squarish, slightly rugose, strongly keeled, towards sides shortly mucronate, posteriorly serrate; laterals like dorsals, keeled, serrate, spinose; ventrals quadrangular, smooth, not or but slightly imbricate; scales below fore limbs keeled, below hind limbs smooth or slightly keeled; tail with whorls of large, striate, strongly keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, black, uniform. Below, black, uniform except for the femoral pores and lemon yellow callose patches on the femur of males.

Size. Total length of a ♂ (T.M. 18090), 169 (78 + 91) mm.; of a ♀ (T.M. 18088), 178 (81 + 97) mm.

Remarks. Its describer distinguishes *peersi* from *c. niger*, the only other entirely black member of the genus, by its swollen nasal which is never (1937d) so elongate as in *cordylus* and its races; by the gulars which are uniform anteriorly (except for a few lateral ones) and pass gradually into the larger posterior; by the stronger keeling of tem-

porals and dorsals; and by the band of minute scaling in the lateral fold.

Parasites. Mites (*Scaphothrix conversa* and *Zonurobia polyzonensis*) have been described from this species by Lawrence.

Temperament. Appears to be less timid than other members of the genus (FitzSimons).

Habitat. About a mile outside Garies, Peers found these lizards beneath weathered granite, saucer-like flakes which, on being levered up, were apt to slide down and consequently rendered the capture of the lizards more difficult. At Nieuwerust, about 90 miles south of Garies, and separated from it by a vast stoneless plain, others were encountered on kopjes where they were living under fragments of the great granite boulders. FitzSimons found *peersi* occupying the upper slopes of kopjes while *p. polyzonus* occurred on the lower.

Localities. **Cape Province:** Little Namaqualand: Garies; Kamieskroon; Nieuwerust.

Range. Little Namaqualand, Cape Province.

CORDYLUS UKINGENSIS (Loveridge)

1900b. *Zonurus cordylus* Tornier (not Linné), p. 590.

1932a. *Zonurus ukingensis* Loveridge, Bull. Mus. Comp. Zoöl., **72**, p. 378, pl. iii, fig. 2: Tandala, Ukinga, Tanganyika Territory.

1933h. Loveridge, p. 301, pl. iii, fig. 2.

1937f. Loveridge, p. 495.

Description. Head slightly depressed; rostral separated from the frontonasal, which is as long as broad; nostril pierced in the postero-inferior corner of a *very* large nasal¹ which is not much swollen; no loreal; a preocular; median subocular not descending to the lip; fifth upper labial smallest, fifth not higher than others; prefrontals forming a suture; postfrontals longer than broad; interparietal on a line with the anterior parietals, in contact with the postfrontals; posterior parietals slightly larger than the anterior; 6 keeled occipitals; temporals rugose, keeled, without spines; sides of neck with keeled, spinose scales; gulars small, the anterior *not* enlarged, the median slightly imbricate, *all* strongly keeled and mucronate; collar scales large, lanceolate, and mucronate.

Dorsals squarish, rugose, strongly keeled, shortly mucronate, posteriorly serrate, the two vertebral rows enlarged; laterals like dorsals

¹ Tornier remarks that in one of his three specimens the nasal is divided on the right side to form a prae- and post-nasal as he terms them, on the left it is entire.

but smaller, keeled, spinose; ventrals quadrangular, keeled, not or but slightly imbricate, the lateral shortly mucronate; scales below fore and hind limbs keeled; tail with whorls of large, striate, strongly keeled, serrate, spinose scales above and below, dorsal and lateral spines subequal in length.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head dark brown; back sepia brown variegated with ochraceous brown; flanks flecked with lighter. Below, white, faintly mottled with gray.

Size. Total length of ♂ type (M.C.Z. 30761), 87 (54 + 33) mm.

Remarks. Diagnostic characters distinguishing *ukingensis* from *c. cordylus* and *c. jonesii* have been given in detail (1932a), and for *c. tropidosternum* (1933h) also. This dwarf form is known only from the type, and three specimens in the Berlin Museum.

Localities. **Tanganyika Territory:** Iringa; Kuthu steppe; Mbowu River, Unyika; Tandala, Ukinga.

Range. Southern highlands of Tanganyika Territory (i.e. mountains at north end of Lake Nyasa).

CORDYLUS MACROPHOLIS (Boulenger)

- 1910b. *Zonurus macropholis* Boulenger, Ann. S. African Mus., 5, p. 494:
Little Namaqualand, Cape Province, Union of South Africa.
1930. Power, p. 16.
1933a. Power, p. 215.
1935. Lawrence, p. 44.
1936h. Loveridge, p. 58.
1937. Lawrence, p. 109.

Description. Head slightly depressed; head shields strongly rugose; rostral separated from the frontonasal, which is shorter than broad; nostril pierced in the postero-inferior corner of a large nasal which is not much swollen; a loreal; a preocular; median subocular not descending to the lip; fifth upper labial longest, not or but slightly higher than others; prefrontals forming a suture; postfrontals longer than broad or as long as broad; interparietal on a line with the anterior parietals, in contact with, or separated from, the postfrontals; posterior parietals *smaller* than the anterior; 4-5 rugose occipitals; temporals rugose, keeled, without spines but those of hind row pointed, projecting over ear; sides of neck with keeled, spinose scales; gulars large, a few anterior moderate followed by smaller, slightly imbricate, *all* strongly keeled and mucronate; collar scales large, keeled, mucronate.

Dorsals squarish, rugose, strongly keeled, shortly mucronate, posteriorly serrate, the two vertebral rows enlarged; laterals like dorsals but slightly smaller, keeled, serrate, spinose; ventrals quadrangular, smooth, strongly imbricate, the lateral strongly keeled and shortly mucronate; scales below fore limbs keeled, below hind limbs smooth or slightly keeled; tail with whorls of large, rugose, strongly keeled, serrate, spinose scales above and below, dorsal and lateral spines subequal in length.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head and back olive brown irregularly blotched with blackish brown. Below, pale olive or brownish.

Size. Total length of type, 130 (68 + 62) mm.; of a ♂ (Field Mus.), 119 (67 + 52) mm.

Remarks. For twenty-three years known only from the type, then Power obtained a series. The scale termed "postnasal" by Power (1933a) is that usually regarded as a loreal, similarly his "loreal" is the preocular.

Habitat. Never having been taken in rock crevices, this dwarf species is suspected of living in burrows (Lawrence).

Localities. **Cape Province:** Little Namaqualand: Kleinzee.

Range. Little Namaqualand, Cape Province.

CORDYLUS CATAPHRACTUS BOIE

Plate 5, fig. 3

Plate 6, figs. 1-2

1828. *Cordylus cataphractus* Boie, Nova Acta Acad. Leop.-Carol., 14, pt. 1, p. 140: South Africa.
1843. Smith, A., pl. xxix, pl. xxx, figs. 9-9a-9b.
- 1831b. *Zonurus Cataphractus* Gray, p. 63.
1839. Duméril & Bibron, p. 355.
- 1885e. Boulenger, p. 255.
- 1887b. Boettger, p. 143.
1898. Slater, p. 103.
- 1907b. Roux, p. 417.
- 1909a. Hewitt, pp. 33, 36.
- 1910b. Boulenger, p. 468.
- 1911d. Sternfeld, p. 21.
- 1914a. Hewitt, p. 240.
1929. Rose, pp. 100, 218, figs. 63-64.

1930. FitzSimons, p. 29.
 1930. Peers, p. 402, photos. 1-4, pls. i-ii.
 1930. Power, p. 15.
 1930. Schmidt, p. 154, photo.
 1931. Mann, pp. 390, 397.
 1931. Popp. p. 191, photos.
 1931. Senfft, p. 73, photos.
 1933b. Noble & Bradley, p. 75.
 1935a. FitzSimons, p. 533.
 1935. Lawrence, p. 44.
 1937. Lawrence, p. 110, fig. 3.
 1938. FitzSimons, p. 191.
 1834. *Zonurus cordylus* Schlegel (not Linné), p. 211, pl. vii, figs. 3-3c.
 1938a. *Cordylus nebulosus* Smith, Mag. Nat. Hist. (2), 2, p. 31: South Africa.

Native names. Armadillo lizard (English: Rose); *blinkoog* (Dutch: Peers).

Description. Head much depressed; head shields strongly rugose; rostral separated from the frontonasal, which is longer than broad; nostril pierced in the centre of a very large nasal which is much swollen; a small loreal present or absent; a preocular; median subocular not descending to the lip; third or fourth upper labial smallest, fifth frequently higher than others; prefrontals well separated; postfrontals longer than broad or as long as broad; interparietal on a line with the anterior parietals, in contact with the postfrontals; posterior parietals much larger than the anterior; 5-6 rugose occipitals, the outermost pointed and directed obliquely backwards; temporal region very prominent, temporals large, rugose, keeled, without spines, but those of hind row pointed, projecting over ear; sides of neck with keeled, spinose scales; gulars small, the anterior irregularly enlarged, the median not or but slightly imbricate, smooth, or the lateral feebly keeled; collar scales large, mostly smooth, imbricate.

Dorsals elongate, rugose, strongly keeled, shortly mucronate, posteriorly serrate, those on the vertebral line regular or irregular; laterals like dorsals but more spiny, keeled, serrate, spinose; ventrals elongate or quadrangular, *all* smooth, not or but slightly imbricate; scales below fore limbs keeled, below hind limbs smooth or some keeled; tail with whorls of large, rugose, strongly keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head and back usually yellowish brown, occasionally chocolate brown, uniform, or a piebald arrangement of these colors.

Young lizards are predominantly brown. Below, gular region light yellow vermiculated, streaked, or spotted with black; belly yellowish, clouded with greenish black or dark brown spots or stripes.

Transference of three armadillo lizards from their arid habitat to the moister and colder climate of the Cape Peninsula, resulted in *striking color changes*, but whether humidity, temperature, or food was the principal factor is not clear. A young lizard, two-and-a-half inches long, became a very light creamy yellow and grew larger than the adults. The latter, originally yellow and brown, changed to a lighter hue of greenish yellow, most apparent on their heads; meanwhile the brown of their backs became blotchy, not fading into yellow (Peers).

Size. Total length of ♂ (T.M. 15970), 211 (103 + 108) mm.

Remarks. According to Peers, about 20% of these lizards have the dorsal rows interrupted on the vertebral line instead of forming regular rows; such a variation, as well as normal and intermediate conditions, being found in members of a family group, there appears to be no geographical significance attached to it (Peers). Moreover it is to be found in several other species.

The best account of the bionomics of this lizard is that of Peers, to whose article I am indebted for much of the information given below.

Anatomy. The iris and pupil have been described by Mann.

Sexual dimorphism and dichromatism. The head of the male is broader, his habit more robust, his gular markings brighter than those of his mate, around whom he prances, his head held high, the better to display his brightly marked throat (Peers).

Breeding. Takes place about October when one or two young are produced, these rupturing the enveloping membranes immediately after parturition. (Peers), but in Germany a captive, 200 mm. female gave birth to a 100 mm. young one on February 2nd or 3rd, according to Popp, who furnishes a photograph of a pair *in coitu*.

Diet. When termites appear at the onset of the rains, armadillo lizards gorge upon them; the fat derived from this prey tides them over the succeeding weeks of wet and cold. Beetles and grasshoppers, whose movements are quickly observed by these bright-eyed lizards, are captured after a short rush which rarely fails (Peers).

In captivity young lizards will take maggots, other soft-skinned larvae, and flies. As they grow older, smooth caterpillars, beetles, crickets, but above all grasshoppers; on the latter, which seem most appreciated, they will feed to repletion. It is true that at first they will take mealworms, holding them in their jaws until dead, but these

appear to disagree with them for they are frequently regurgitated, while after a time the lizard will refuse them. Earthworms were also rejected. When some other lizards (apparently *Lacerta*. A.L.) were temporarily placed in their case, they were seized by head or middle, crunched and eaten by the carnivorous armadillo lizards. Senfft also fed his specimens with raw egg, brains, and a few drops of vigatol but failed to keep them alive (Popp, Senfft *et al*).

Enemies. Mongoose, musihonde and veld rats are a constant menace to the armadillo lizards which survive attacks by keeping close to their rocky crevices.

Defence. On gaining its rocky retreat an armadillo lizard takes full advantage of the prominent keeled temporals and its lateral spinosities by insinuating itself so firmly into the crevice that removal of the boulders is often necessary before the creature can be captured. When exposed in this manner, or if the little reptile has been intercepted before gaining its rocky refuge, the armadillo lizard coils up and takes its tail in its mouth. The strongly spinose and plated tail and limbs thus afford protection to the otherwise vulnerable under parts. Once this posture has been assumed the lizard will permit itself to be rolled around rather than uncoil, nor will it do so as long as it senses danger or sees movement in its immediate vicinity. The tail plays so important a role that it is never dropped as a means of defence, nor is it readily detached, but if part is lost regeneration is slow and the reproduced appendage apparently never attains the full dimensions. For further details see Peers' account.

Temperament. Relatively slow moving (Rose). In captivity at least the young are somewhat more active than the sluggish adults (Schmidt). On account of this sluggishness armadillo lizards are extremely easy to catch, readily tamed, and make the most confiding pets (FitzSimons). Consequently in the years 1930-1931 the market in Germany was flooded with them and accounts such as those of Senfft and Popp furnish many details of their care in vivaria, the necessity for sun-lamps, questions of humidity, and maintenance of temperatures of from 25-28° C. by day, 15-18° by night, etc.

Habitat. Found only in the smooth sandstone rocks; granite outcrops appear unsuitable, possibly because granite fractures less regularly and deeply than does the sandstone. The presence of these lizards in a crack is usually betrayed by undigested calcareous or chitinous fragments of insects from the excrement, such deposits being considerable where the crevice has been long occupied. Each fissure is inhabited by one family only, intrusion by an outsider being fiercely

resisted; however a family may consist of as many as eight individuals, i.e. the original pair of adults and their resulting offspring of several seasons.

A nocturnal gecko (*Pachydactylus b. bibronii*) seems to be the only other lizard permitted to share the family retreat, perhaps because no competition arises with regard to food. Though *Agama a. atra* and *Cordylus p. polyzonus* may be found on the same kopjes, there is no association with the armadillo lizard.

Localities. Cape Province: Bitterfontein; Calvinia District; Clanwilliam District; Hondeklip Bay; Jackalswater to Orange River; Kamaggas; Malmesbury; Matjesfontein¹; Port Nolloth; Soebatsfontein; 32 miles west of Springbok along the Kamaggas Road.

Range. Western Cape Province to the southwestern corner of Little Namaqualand, i.e. a coastal strip of about 100 miles south of the Orange River and inland for about 150 miles¹.

CORDYLUS PUSTULATUS (Peters)

Plate 6, fig. 3

- 1862a. *Zonurus pustulatus* Peters, Monatsb. Akad. Wiss. Berlin, p. 19: Nue Barmen, South West Africa.
 1885e. Boulenger, p. 258.
 1909a. Hewitt, p. 36.
 1910b. Boulenger, p. 469.
 1911b. Sternfeld, p. 401, fig. 1.
 1911d. Sternfeld, p. 22.
 1930. Power, p. 15.
 1935. Lawrence, p. 44.

Description. Head much depressed; head shields rugose; rostral separated from the frontonasal; nostril pierced in the lower centre of a large nasal which is swollen; a loreal; a preocular; median subocular not descending to the lip; fifth upper labial smallest, fifth not higher than others; prefrontals forming a suture; temporals moderate, rugose, keeled, without spines; gulars small, almost granular.

Dorsals and other scales said to resemble those of *polyzonus*. This brief description is based on Peters, scanty one together with data derived from Sternfeld's side view of the head, a drawing which may not be too exact in details such as the number of labials, etc.

¹ Boulenger's (1910b) Matjesfontein record has been questioned by Power (1930) as being much too far east. However Dr. V. FitzSimons' assures me that *cataphractus* is plentiful at Matjesfontein.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head and back olive brown spotted with darker brown and yellow, with a tendency for the latter to form an indistinct dorsal line. Below, brownish yellow.

Size. Total length of a cotype (Berlin Mus.), 195 (82 + 113) mm.; and of one of Sternfeld's specimens, 170 (73 + 97) mm.

Remarks. Misled by Peters' comparing his cotypes with *polyzonus*, Boulenger (1885e), followed by Power (1930) assumed that *pustulatus* had supranasals. However, Sternfeld (1911b), with two additional lizards from "South West Africa", reëxamined the cotypes and stated that they, as well as his specimens, lacked supranasals and were more nearly related to *cordylus*. He invited attention to the suture from nostril to first labial which was displayed by all. Mertens (1937b, p. 8), commenting on a *pustulatus* in the Senckenberg Museum, confirmed Sternfeld's findings. FitzSimons (1943) treats *pustulatus* as a race of *cordylus*, but the large number of longitudinal dorsal scales (see statistical table) seem to preclude this.

Localities. **South West Africa:** Hereroland: "Neu Barmen" = Otjimbingue (*vide* Sternfeld).

Range. South West Africa.

CORDYLUS NAMAQUENSIS (Methuen & Hewitt)

1910a. ?*Zonurus cordylus* Werner (not Linné), p. 324.

1914b. *Zonurus namaquensis* Methuen & Hewitt, Ann. Transvaal Mus., 4, p. 137: Great Karas Mountains, South West Africa.

1930. FitzSimons, p. 29.

1930. Power, p. 15.

1935. Lawrence, p. 43.

1938. Fitzsimons, pp. 190, 191.

Description. Head much depressed; head shields rugose except for two hindmost supraoculars; rostral rarely in contact with, usually separated from, the frontonasal, which is shorter than broad; nostril pierced in the lower centre of a very large nasal which is much swollen; a loreal; a preocular; median subocular not descending to the lip; prefrontals forming a suture; postfrontals as long as broad; interparietal on a line with the anterior parietals, in contact with the postfrontals; posterior parietals slightly larger than the anterior; 6 keeled occipitals; temporals moderate, rugose, keeled, without spines¹, but those of hind

¹ Hewitt says spines moderate or poorly developed.

row pointed, projecting over ear; sides of neck with keeled, spinose scales; gulars small, the anterior irregularly enlarged, the median slightly imbricate, smooth, or the lateral feebly keeled; collar scales large, only the lateral lanceolate and mucronate.

Dorsals elongate, scarcely rugose, moderately keeled, neither mucronate nor serrate, those on the vertebral line regular or irregular; laterals like dorsals but more spiny, keeled, serrate, spinose; ventrals quadrangular, smooth, not or but slightly imbricate; scales below fore limbs keeled, below hind limbs smooth; tail with whorls of large, striate, strongly keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown, heavily spotted, a dark streak from nostril through eye to ear or fore arm, a narrower streak from posterior corner of eye along upper edge of temporals, lower labials edged with darker; back light to dark chestnut brown variegated with darker brown; two dark brown lateral bands sometimes present. Below, grayish white to light muddy brown; tail light brown.

Size. Total length of type (T.M. 3163), 170 (81 + 89) mm.

Remarks. One wonders if Werner's (1910a, p. 324) *cordylus* from "S. Africa" with 10-11 femoral pores and color of *namaquensis* is not that species with which it agrees in all of the data published.

Parasites. Mites (*Zonurobia montana*) were found by Lawrence.

Habitat. Occurs at 6200 feet (Hewitt) as well as on lower slopes of mountain (FitzSimons) and in rocky crevices of a river bed.

Localities. **South West Africa:** Great Karas Mountains:—Kochena Farm; Narudas Sud Farm; Sandmund; and summit of a mountain near Wasserfall.

Range. Great Karas Mountains and vicinity, South West Africa.

CORDYLUS CAMPBELLI (FitzSimons)

1938. *Zonurus campbelli* FitzSimons, Ann. Transvaal Mus., 19, p. 189: Barby Farm, 10-20 miles east of Helmeringshausen, South West Africa.

Description. Head much depressed; head shields rugose; rostral separated from the frontonasal, which is longer than broad or as long as broad; nostril directed upwards and outwards in a nasal which is much swollen and slightly tubular; lower eyelid with a semitransparent disk; prefrontals forming a suture; postfrontals as long as broad; inter-

parietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 6 keeled, rugose occipitals; temporals moderate, rugose, keeled, without spines, but those of hind row obtusely pointed and flattened, projecting over ear; sides of neck with keeled, spinose scales; gulars small, the anterior irregularly enlarged, the median slightly imbricate, smooth, or the lateral feebly keeled; collar scales large, only the lateral lanceolate and mucronate.

Dorsals elongate, scarcely rugose, obtusely keeled, neither mucronate nor serrate, those on the vertebral line irregular; laterals like dorsals but more spiny, keeled, serrate, spinose; ventrals quadrangular, smooth, slightly imbricate; scales below forelimbs keeled; below hind limbs smooth, serrately pointed, imbricate; tail with whorls of large, striate, strongly keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head chestnut brown, labial region lighter; back chestnut brown spotted and irregularly crossbarred with darker brown, a broad vertebral band or chain bearing pale yellowish spots; tail chestnut brown more or less barred with dark brown. Below, grayish white, gular region with rusty infuscations; forelimbs straw yellow; callose patch anterior to, as well as, femoral pores of male, pale yellow.

Size. Total length of ♂ type (T.M. 17635), 164 (76 + 88) mm.; of paratype ♀ (T.M. 17637), 162+ (79 + 83+) mm., tail-tip being lost.

Habitat. The type series were taken in rock fissures among outcrops on valley slopes of Barby Farm, which is northwest of Keetmanshoop and the Great Karas Mountains, Great Namaqualand.

Localities. **South West Africa:** Great Namaqualand: Barby Farm.

Range. Great Namaqualand, South West Africa.

CORDYLUS POLYZONUS POLYZONUS Smith

Plate 6, fig. 4

Plate 7, fig. 1

- 1838a. *Cordylus polyzonus* A. Smith, Mag. Nat. Hist. (2), 2, p. 31: Cape of Good Hope.
1843. Smith, A., pl. xxviii, fig. 1; xxx, figs. 7-7b: North of Orange River and within the Colony, i.e. Cape Province.
1845. Gray, p. 47.
1839. *Zonurus polyzonus* Duméril & Bibron, p. 357.

- 1885e. Boulenger (part), p. 257.
 1887b. Boettger (part), p. 143.
 1888b. Fischer, p. 12.
 1893a. Boettger (part), p. 66.
 1896c. Bocage, p. 117.
 1898. Slater, p. 103.
 1903e. Boulenger, p. 217.
 1905h. Boulenger, p. 253.
 1907b. Roux, p. 421.
 1909a. Hewitt (part), p. 36 (omit Walfish Bay).
 1910b. Boulenger, p. 469 (omit Natal as error).
 1910a. Werner (part), p. 325 (omit S. Hereroland only).
 1911b. Hewitt, p. 47.
 1911b. Sternfeld (part), p. 402.
 1911d. Sternfeld (part), p. 22, fig. 21 (omit Rehoboth, etc.).
 1913. Hewitt & Power, p. 154.
 1913a. Werner, p. 108.
 1914b. Methuen & Hewitt (part), p. 137.
 1918. Power, p. 264.
 1928. Cott, p. 953.
 1929. Rose, pp. 100, 218.
 1930. FitzSimons (part), p. 29 (omit Okahandja).
 1930. Power, p. 14.
 1933a. Power, p. 215.
 1934a. Cott, p. 153.
 1935a. FitzSimons, p. 534.
 1935. Lawrence, p. 43.
 1936. Parker, p. 134.
 1937a. FitzSimons, p. 266.
 1937e. Hewitt, p. 30, pl. x, fig. 7.
 1937. Lawrence, p. 109.
 1938. FitzSimons, p. 192.
 1940c. Scortecchi, p. 7.

Further citations of "*polyzonus*" will be found under *p. jordani*.

Names. Karroo Girdle-tail (English); *likkwanakkedis* (Kogopa).

Description. Head much depressed; head shields rugose; rostral separated from the frontonasal, which is as long as broad or shorter than broad; nostril pierced in the postero-superior corner of a very small nasal which is much swollen; a loreal (rarely fused with first labial), a preocular; lower eyelid with a semitransparent disk; median subocular descending to the lip between the fourth and fifth, or fifth and sixth, upper labials; fourth upper labial lowest, fifth higher than others; *supranasals forming a suture*; prefrontals forming a suture;

postfrontals as long as broad or shorter than broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 5-6 rugose occipitals; temporals moderate (slightly smaller than in *p. jordani*), rugose, keeled, without spines, but those of hind row pointed, projecting over ear; sides of neck with short, keeled, spinose scales; gulars small or moderate, the anterior irregularly, or not, enlarged, the median slightly imbricate, smooth, or the lateral feebly keeled; collar scales slightly enlarged, undifferentiated.

Dorsals elongate, rugose, slightly or strongly keeled, neither mucronate nor serrate, those on the vertebral line regular or irregular; laterals like dorsals but more strongly keeled, serrate, spinose; ventrals quadrangular, smooth, not or but slightly imbricate, the lateral sometimes slightly keeled and shortly mucronate; scales below fore limbs keeled, below hind limbs smooth or slightly keeled; tail with whorls of large, rugose, strongly keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Very variable, scarcely two the same. Above, head brown; back yellowish brown, olive brown, chestnut brown, or blackish brown, uniform, variegated, or blotched with darker, the irregularly shaped spots tending to form two longitudinal lines; a blackish streak on side of neck; tail yellowish brown sparingly spotted with umber brown. Young are olive chequered with black and white, their tails barred brown and white. Below, whitish, yellowish, brownish or reddish, uniform or clouded with darker spots and stripes.

Power (1918) writes of the dark dorsal coloring harmonizing perfectly with the environment, but the "brilliant red" gular ventral surface possessed by both sexes throughout the year, displayed to advantage as they sit erect, is immediately concealed at the approach of danger by the lizard pressing its chin close to the rock. From this he concludes that the ventral pigmentation has no significance as a warning color. Later (1933a), he records De Aar lizards as being "very dark purple, almost black" below, those at Orange River Station, as being "brick red sprinkled with very dark purple" etc. Hewitt (1937e), however, speaks of adults which are almost black in the breeding season. For further variations consult FitzSimons (1935a; 1938).

Remarks. FitzSimons (1937a) offers comments on three cotypes in the British Museum. Scortecchi (1940c) remarks on scale formation in this species, contrasting it with that of other families.

Size. Total length of a ♂ (T.M. 18206), 237+ (116 + 121+) mm., and of an unsexed specimen (T.M. 15343), 266 (114 + 152) mm.

Sexual dimorphism. Femoral pores are present in the males only to any appreciable degree of development.

Breeding. Mating takes place early in September and the young are born in January (presumably in Cape Province) according to Hewitt and Power. However four fully developed young were present in uteri of a female taken in April at Kubub, South West Africa (Werner).

Diet. Beetles, locusts and other insects, but one contained a gaudy and nauseous grasshopper (*Zonoercus elegans*), another grass stalks (Hewitt & Power).

Parasites. Mites (*Ixodiderma inverta*; *Scaphothrix convexa*; *Zonurobia polyzonensis*) were found by Lawrence; while nematodes are said to infest this species at times according to Hewitt and Power.

Defence. The tail is employed to shield the body as soon as the rock shelter is reached, but the tail, though brittle, is not parted with unless the lizard is subjected to very rough handling (Hewitt & Power).

Temperament. Alert and active (FitzSimons). Shy and timid though occasionally attempting to bite when tormented (Hewitt & Power).

Hibernation. This is neither long nor deep (Hewitt & Power).

Habits. Apparently polygamous for nine females accompanied by only a single male were found in one locality (Hewitt & Power).

Habitat. This common species occurs in rocky situations over a wide area, often in the vicinity of human habitations. They like to bask in the fierce summer heat with belly pressed to the rock but forepart raised, the head and neck being almost vertical. In this position a lizard will remain for hours, only turning its head in response to sounds or to watch some movement in the vicinity. On hot days they face the sun, but on cold ones prefer to expose their backs to its warming rays. If disturbed each lizard quickly retires beneath some boulder or into its particular crevice, for they exhibit a marked attachment to the same retreat.

Localities. **Bechuanaland Protectorate:** Kuruman. **Orange Free State:** Bloemfontein; Boshof; Jacobsdal; Smithfield. **Cape Province:** Albert; Aliwal North; Barkly West; Belmont; Bredasdorp; Britstown; Bros Pan; Burghersdorp; Calvinia; Cape Town; Clanwilliam; Colesberg; Cradock; De Aar; Deelfontein; Fauresmith; Fort Richmond near Herbert; Fourteen Streams; Garies — near; Graaff-Reinet; Hanover; Hay; Herbert; Hoetjes Bay; Hope-

town¹; Jackalswater; Kamaggas; Kenhardt; Kimberly; Klaver; Klipfontein; Knysna; Kubroos; Lambert's Bay; Lekkersing; Little Namaqualand; Malmesbury; Matjesfontein; Middleburg; Mortimer; O'okiep to Springbok; Orange River Mouth; Orange River Station; Philipstown; Pofadder; Port Nolloth; Prieska; Riet Pan; Rooidam; Rosmead; Rust-en-Vrede; Soebatsfontein; Steinkopf; Steynsburg; Steytlerville; Strydenburg; Touws River; Uitkyk; Upington; Van Rhynsdorp; Van Wyksvlei; Vredendal; Worcester. **South West Africa:** Aus; Aus to Bethany (Bethanien); Barby Farm; Great Karas Mountains; Great Namaqualand; Kakamas; Kolmanskop (M.C.Z.); Kubub; Kuibis; Luderitz Bay (Angra Pequena); Prince of Wales Bay; Sinclair Mine (? subsp); Warmbad.

Range. ²Southern Bechuanaland, Orange Free State, and Cape Province west to southern South West Africa in Great Karas Mountains and at Aus and Barby (where it meets with the northern race—*jordani*).

CORDYLUS POLYZONUS JORDANI (Parker)

- 1862a. *Zonurus polyzonus* Peters (not Smith), p. 18.
 1869b. Peters, p. 660.
 1885e. Boulenger (part), p. 257.
 1887b. Boettger (part), p. 143.
 1890b. Müller, p. 699.
 1893a. Boettger (part), p. 66 (Damaraland only).
 1894a. Boettger, p. 89.
 1907. Schultz, p. 188, fig.
 1909a. Hewitt (part), p. 36 (Walfish Bay record).
 1910a. Werner (part), p. 325 (Hereroland only).
 1911b. Sternfeld (part), p. 402 (2 specimens lacking black mark).
 1911d. Sternfeld (part), p. 22 (Rehoboth; Damaraland; Hereroland).
 1914. Methuen & Hewitt (part), p. 137.
 1915c. Werner, p. 338.
 1930. FitzSimons (part), p. 29, (Okahandja, record only).
 1936c. *Zonurus jordani* Parker, Novit. Zool., 40, p. 133: Hoffnung, near Windhoek, South West Africa.
 1938. FitzSimons, p. 191.
 1937b. *Cordylus jordani* Mertens, p. 8.

Description. Head much depressed; head shields rugose; rostral separated from the frontonasal, which is as long as broad or shorter

¹ The Irene record was subsequently corrected by Hewitt (1911b).

² The Natal record is doubted by both Boulenger and Power, and is quite out of the question according to FitzSimons (letter).

than broad; nostril pierced in the postero-superior corner of a very small nasal which is much swollen; a loreal; a preocular; lower eyelid with a semitransparent disk; median subocular descending to the lip between the fourth and fifth, or fifth and sixth, upper labials, fourth or fifth upper labial lowest, fifth or sixth higher than others; *supra-nasals forming a suture*; prefrontals forming a suture; postfrontals as long as broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly larger than the anterior; 6 rugose occipitals; temporals large (slightly larger than in *p. polyzonus*), keeled, without spines, but those of hind row pointed, projecting over ear; sides of neck with short, keeled, spinose scales; gulars small, the anterior irregularly enlarged, the median slightly imbricate, smooth, or the lateral feebly keeled; collar scales slightly enlarged, undifferentiated.

Dorsals elongate, slightly rugose, moderately keeled, neither mucronate nor serrate, those on the vertebral line regular or irregular; laterals like dorsals but more strongly keeled, serrate, spinose; ventrals quadrangular, smooth, not or but slightly imbricate, the lateral sometimes slightly keeled and shortly mucronate; scales below fore limbs keeled, below hind limbs smooth or slightly keeled; tail with whorls of large, rugose, strongly keeled, serrate, spinose scales above and below, the lateral spines longest.

For characters common to all species, see definition on p. 9; for scale and pore counts, see statistical table on p. 15.

Color. Above, head brown or yellow; back yellowish, pale brown, or olive brown, uniform (in old lizards) or variegated and barred with darker; *no black streak on side of neck*; flanks yellowish to pale olive. Below, whitish or pale straw, uniform, or gular region longitudinally vermiculated with gray; tail yellowish or brownish.

Size. Total length of ♂ (T.M. 17468), 251 (125 + 126) mm.; of ♀ (T.M. 17496), 255 (127 + 128) mm. Length of ♀ holotype (Brit. Mus.) from snout to vent was 111 mm., the tail-tip lost.

Remarks. The describer, in addition to the characters utilized in the key for separating this form from *p. polyzonus*, mentions the larger temporals of *jordani*—a valid character but difficult to appreciate without comparative material—and the number of dorsals in transverse row, the latter no longer holds. FitzSimons (1938) says that in *polyzonus* there are usually 6 large sublabials beneath the lower jaw, whereas in his twenty-one *jordani* there are but 5. In our M.C.Z. material of *p. polyzonus* both 5 and 6 are so common that I doubt the value of such an average character for taxonomic purposes.

FitzSimons (1935a) reports that specimens from Aus—which is in

the area where one would expect to encounter intergrades—with 12–16 femoral pores, i.e. *p. polyzonus*, have the intensive caudal keeling, and spinosity which one would expect of *p. jordani*, thus offering further justification of our treating *jordani* as a race of *polyzonus*.

Localities. South West Africa: Aus — 15 miles east of; Barby Farm; Damaraland; Helmeringhausen; Hereroland; Hoffnung; Karub; Keetmanshoop; Kobos; Kraikluft; Kraikluft to Sandmund; Kraikluft to Alt Wasserfall; Neu Barmen; Neudamm Farm; Okahandja; Okosongomingo; Otjosongombe; Rehoboth; Usakos; Walfish Bay; Waterberg; Windhoek (Windhuk).

Range. South West Africa from Great Karas Mountains, Aus and Barby Farm, Great Namaqualand (where the typical form also occurs) north to Herreroland.

GENUS PSEUDOCORDYLUS

1838a. *Hemicordylus* A. Smith, Mag. Nat. Hist. (2) 2, p. 32 (type *capensis* Smith).

1838a. *Pseudocordylus* A. Smith, Mag. Nat. Hist. (2) 2, p. 32 (type *montanus* Smith = *microlepidotus* Cuvier).

Head and body depressed; limbs well developed; tail moderate. Head shields regular; nostril pierced in a nasal or between nasal and first labial; eyelids well developed; ear-opening large; 4 parietals; sides of neck covered with granules; a collar fold, attached mesially, at least indicated; dorsals usually small, soft or nodular, usually intermixed with granules, in more or less regular series which, if extending to occiput, are much reduced on nape if not granular; ventrals large, quadrangular or subtriangular, juxtaposed, smooth, forming longitudinal and transverse series; femoral pores present in both sexes; digits slightly keeled inferiorly; tail spinose.

Those species which I have examined appear to have the following characteristics in common, consequently these have been omitted from the specific descriptions.

Head longer than broad; head shields more or less smooth anteriorly, rugose posteriorly; rostral at least twice as broad as high; nasal scarcely swollen; postnasal present only as an aberration; a loreal; a preocular; subocular descending to the lip between two labials; fifth upper labial not higher than the others (except in figure of *m. fasciatus*); anterior supraocular longest, the second (sometimes first and second in *robertsi*) broadest; prefrontals forming a suture (sometimes separated

in *capensis* and *robertsi*); frontal hexagonal, slightly broader anteriorly; interparietal enclosed between 2 pairs of parietals (sometimes not in *capensis*); posterior parietals much (sometimes only slightly in *robertsi*) larger than the anterior; occipitals much reduced or absent; mental rather large; lower labials bordered by a row of 5 large shields; lateral collar scales enlarged but otherwise undifferentiated; a slight lateral fold; a pair of enlarged preanals; limbs covered above with large, keeled, more or less spinose, imbricate or subimbricate scales; tail with whorls of large, alternating with whorls of smaller, rugose, keeled, mucronate scales, the lateral spines longest, subcaudals long and narrow.

Range. Union of South Africa south of 24°S.

Remarks. The transference of *capensis* (and *robertsi*) from *Cordylus* to this group to which they appear more nearly related, for reasons stated elsewhere (p. 71), raises the question as to whether the subgenus *Hemicordylus*, which has paragraph precedence, should not be employed in preference to the former subgenus *Pseudocordylus*. As, however, this is not mandatory under the International Code of Nomenclature, I prefer to use the name *Pseudocordylus*, not merely on account of its having been raised to generic status by Gray (1845) and consequently long-standing in usage, but also because it is not improbable that later it may be found advisable to accord generic status to the group of annectant species at present characterized only by *capensis*, *robertsi* and *langi*.

Key to the Species

1. Flanks entirely covered with minute granules or at most some widely separated, small, subconical tubercles differing greatly from the enlarged dorsals 2
 Flanks entirely covered with granule-surrounded nodular scales, or scales only, which are a continuation of the dorsals 4
2. Back entirely covered with strongly keeled dorsals forming 10-12 longitudinal rows; ventrals in 8 longitudinal rows; range: southern Cape Province between False and Mossel Bays *capensis*
 (p. 70)
 Back, or vertebral region only, covered with feebly keeled, or smooth, dorsals of which at most (in *robertsi* only) only one or two dorso-lateral rows are strongly keeled 3

3. Slightly enlarged dorsals form 12-20 irregular, ill-defined, longitudinal rows covering entire back; ventrals in 8 longitudinal rows; enlarged temporals 10-13; range: Van Rhynsdorp District, Cape Province *robertsi*
(p. 71)
- Slightly enlarged dorsals form 6-8 irregular, ill-defined, longitudinal rows in vertebral region; ventrals in 10 longitudinal rows; enlarged temporals 5-6; range: Drakensberg of Basutoland to eastern Cape Province (possibly southwestern Transvaal if Doornkop referable) *langi*
(p. 73)
4. Temporals of the upper row enlarged and vertically elongate 5
Temporals of the upper row relatively small and polygonal, at most but one or two vertically elongate 6
5. Median gulars mostly elongate like the lateral; range: Mountains of southern Transvaal and Orange Free State south to Drakensberg, Natal *m. melanotus*¹
(p. 75)
- Median gulars more or less squarish, not even *slightly* elongate like the lateral; range: Mountains of western Cape Province *m. namaquensis*
(p. 78)
6. Enlarged temporals about 8-11; median gulars slightly elongate like the lateral; range: Mountains of the Cape Peninsula, Cape Province *m. microlepidotus*
(p. 79)
- Enlarged temporals about 16-17; median gulars more or less squarish, not even *slightly* elongate like the lateral; range: Mountains of eastern Cape Province *m. fasciatus*
(p. 80)

¹ Includes *subviridis* (A. Smith) and *s. transvaalensis* (FitzSimons).

STATISTICAL SYNOPSIS OF VARIATION IN THE GENUS PSEUDOCORDYLUS

Species or Race	Rostral breadth into height	Supraoculars	Supraillaries	Suboculars	Upper labials	Lower labials	Occipitals	Enlarged temporals	Longitudinal ventral rows	Transverse ventral rows	Femoral pores
<i>capensis</i>	3	4	4	3	5-6	6	0	14-15	8	32	17-18
<i>robertsi</i>	2-3	"	4-5	"	5-7	5-7	0	10-13	8	33-36	16-18
<i>langi</i>	2½	"	4-5	"	6-7	5-6	0 to 11	4-6	10-12	31-36	6-14
<i>m. melanotus</i>	2½-4	"	3-5	"	4-7	5-6	0, 6-9	6-12	12	34-39	4-10
<i>m. namaquensis</i>	?	"	?	"	?	?	8	?	?	?	?
<i>m. microlepidotus</i>	2½-3	"	4-5	"	5-6	5-6	9	8-11	12-14	34-38	5-8
<i>m. fasciatus</i>	2¼	"	3-4	"	5-6	5-6	8	16-17	14	41	6-9

PSEUDOCORDYLUS CAPENSIS (Smith)

Plate 7, figs. 2-3

- 1838a. *Cordylus (Hemicordylus) Capensis* A. Smith, Mag. Nat. Hist. (2), 2, p. 32: Cape of Good Hope.
1843. Smith, A., pl. xxvii, fig. 2; pl. xxx, figs. 6-6b: Hottentot's Holland Mountain, Cape Province.
1839. *Zonurus Capensis* Duméril & Bibron, p. 360
- 1885e. Boulenger, p. 258.
1898. Slater, p. 103.
- 1909a. Hewitt, p. 36.
- 1910b. Boulenger, p. 469.
- 1910a. Hewitt, p. 60.
- 1914a. Hewitt, p. 239.
1930. Power, p. 15.
1935. Lawrence, p. 44.
- 1937a. FitzSimons, p. 266.
- 1937d. Hewitt, p. 206.
1937. Lawrence, p. 110.

Description. Rostral separated from the frontonasal, which is longer than broad or as long as broad; nostril pierced in the lower centre of a nasal; median subocular descending to the lip between the fifth and sixth upper labials; postfrontals as long as broad; interparietal enclosed between two pairs of parietals or on a line with the anterior parietals, forming a suture with the postfrontals; posterior parietals much larger than the anterior; no occipitals; temporals of upper row vertically elongate; gulars smooth, a few anterior ones irregularly enlarged, the median more or less squarish.

Dorsum covered with large, squarish, unequal-sized, strongly keeled scales, more or less intermixed with minute granules, forming 10-12 longitudinal dorsal and 43-44 transverse series from *nape* to base of tail, the 2 vertebral rows largest and separated on the vertebral line by flattish granules of irregular shape; flanks covered with small sub-circular granules; scales below fore limbs smooth, obtusely keeled, or granular, below hind limbs smooth or obtusely keeled.

For characters common to all species, see definition on p. 66, for scale and pore counts, see statistical table on p. 69.

Color. Above, head black or brown, back and sides black or purplish brown with, or without, seven to eight fine, transverse white lines on nape and back. Below, black, or throat and belly dull brownish red; soles of feet pale yellowish brown; tail grayish.

Size. Total length of type (? ♀), first (1838a) given as $7\frac{1}{2}$ inches, later (1843) expressed as 9 unc. 9 lines, is correctly rendered by Boulenger (1885e) as 264 (108 + 156) mm.

Remarks. FitzSimons considers that the discrepancy in size clearly indicates the use of two specimens, on the other hand misprints resulting from Smith's handwriting are not infrequent in "Illustrations." Smith himself says (1843) that the only example which he had seen was taken by Mr. Ford of the 49th Regiment and had been deposited in the Army Medical Museum at Fort Pitt, Chatham. This is obviously the specimen seen by FitzSimons in the British Museum, having been received by them from the Army Medical College.

No other specimens were recorded until Hewitt (1937d) discussed eight which he had received from localities to the northwest and east of the type locality. His findings are embodied in the redescription given above. It is he who suggested the subspecific relationship with *robertsi* which I have hesitated to adopt.

The transference of *capensis* from *Cordylus* to *Pseudocordylus* is because it agrees with the latter in having the neck covered with granules instead of scales, and is so closely related to *robertsi*, whose dorsals lack osteoderms, that I have no misgivings in effecting the transfer. Smith himself recognized the annectant character of *capensis* by erecting the subgenus *Hemicordylus* for its reception; my reasons for not using that name instead of *Pseudocordylus* are discussed under the generic heading.

Localities. **Cape Province:** Hottentot's Holland Mountain east of Stellenbosch; Jonkershoek near Stellenbosch; Langebergen near Swellendam.

Range. Cape Province (Between False and Mossel Bays).

PSEUDOCORDYLUS ROBERTSI (van Dam)

Plate 8, fig. 1

- 1921a. *Zonurus robertsi* van Dam, Ann. Transvaal Mus., 7, p. 241, pl. iv:
Klaver, van Rhynsdorp District, Cape Province.
1930. FitzSimons, p. 30.
1930. Power, pp. 13, 15, fig. 1, pl. ii, fig. 1.
- 1935a. FitzSimons, p. 532.
1935. Lawrence, p. 44.
- 1937d. Hewitt, p. 207.
1937. Lawrence, p. 110.

Description. Rostral separated from the frontonasal, which is longer than broad or as long as broad; nostril pierced in the lower centre of a nasal, often between nasal and first labial; median subocular descending to the lip between the fourth and fifth or fifth and sixth upper labials; postfrontals longer than broad or as long as broad; interparietal enclosed between 2 pairs of parietals; posterior parietals slightly or much larger than the anterior; no occipitals; temporals of upper row vertically elongate; gulars smooth, a few anterior ones irregularly enlarged, the median more or less squarish.

Dorsum covered with small, soft, subquadrangular, feebly or strongly keeled scales, sometimes intermixed with granules, forming 12-20 irregular (rarely regular) longitudinal and 42-64 transverse series from *nape* to base of tail, the 2 vertebral rows, and sometimes 2 dorsolateral rows, enlarged; flanks covered with small, subcircular granules; scales below forelimbs smooth, obtusely keeled, or granular, below hind limbs smooth or obtusely keeled.

For characters common to all species, see definition on p. 66, for scale and pore counts, see statistical table on p. 69.

Color. Above, head and back dark brown or blackish with scattered yellowish spots which sometimes tend to form cross-bars on the dorsum. Below, bluish white to blue gray, the gular region dark blue in males whose callose patches of femoral scales and pores are yellowish or dirty white.

Size. Total length of ♂ type (T.M. 3747), 267 (98 + 169) mm., exceeded in body length by a ♂ (T.M. 15656), 264 (104 + 160) mm.; length of a ♀ topotype (M.C.Z. 41875), 213 (85 + 128) mm.

Remarks. I had already transferred *robertsi* to *Pseudocordylus* prior to reading Power's (1930) remarks on the subject. Despite FitzSimons (1935a) statement, I can find no osteoderms by dissection and thus there appears no reason for retaining *robertsi* in *Cordylus* from all other species of which it differs in having the neck and flanks covered with granules. From the description of *capensis* I imagined that *robertsi* should be treated as a subspecies of it, as has been done by FitzSimons (1943, p. 438). However on receipt of a specimen of *capensis* and making direct comparison with a paratype of *robertsi*, such action appears unjustified. The nasal variation figured by Power seems of no significance and can be matched by members of either genus.

Parasites. Mites (*Zonurobia subquadrata*) described from this species by Lawrence, are most closely related to the species found on *Cordylus cacruleopunctatus*, a point that may have some significance.

Temperament. Shy and difficult to approach (FitzSimons).

Habitat. Found, together with *Agama a. atra*, on the precipitous edges of the escarpment overlooking the low country towards Van Rhynsdorp (FitzSimons), and among the sandstone rocks which form the "tables" of the Table Mountain sandstone near Clanwilliam and Van Rhynsdorp (Lawrence).

Localities. **Cape Province:** Klaver; Van Rhyn's Pass between Nieuwoudtville and Van Rhynsdorp.

Range. Cape Province (Van Rhynsdorp District).

PSEUDOCORDYLUS LANGI spec. nov.

The following references *probably* relate to this form, which in FitzSimons (1943, pp. 467-469) is included in his "*s. subviridis*."

- 1910b. *Pseudocordylus microlepidotus* Boulenger (part, not Cuvier), p. 469 (Moriya, Basutoland).
 1925. Essex, p. 338 (Amatola Mountains, Cape Province).
 1925b. Hewitt, p. 356.
 1928a. Essex, 1927, p. 932.
 1927a. *P(pseudocordylus) subviridis* Hewitt (not A. Smith), p. 392.
 1935. Lawrence, p. 44.
 1937e. Hewitt, p. 31.

Name. Lesser Caiman Lizard (Hewitt).

Type. Museum of Comparative Zoölogy, No. 46835, an adult or subadult ♂ from Mont-aux-Sourcees, Drakensberg, Basutoland, collected by Herbert Lang, November, 1930.

Paratypes. Transvaal Museum, Nos. 13846-7, 13849-50 from same locality as type at 11,000 feet; Nos. 2531, 2533 from Drakensberg on Basutoland side; No. 20992 from Drakensburg near Underberg at 6,000 feet; No. 21063 from Drakensberg near Kokstad.

Diagnosis. Differs from *P. capensis* and *robertsi* in the feeble development of enlarged dorsal scales which are confined to the vertebral region. Differs from *subviridis*, with which it has been confused, and all races of *microlepidotus* in having its flanks covered by homogeneous granules.

Description. Rostral separated from the frontonasal, which is shorter than broad; nostril pierced in the lower centre of a nasal; median subocular descending to the lip between the fourth and fifth labials; postfrontals as long as broad; upper row of temporals vertically elongate; gulars smooth, a few anterior ones slightly enlarged, the median elongated like the lateral.

Dorsum with an irregularly broad vertebral band of small, squarish,

smooth, juxtaposed scales, of which there are 6-8 in longitudinal series, flanked by still smaller, unequal granules similar to those on flanks which scarcely decrease in size towards the lowest part; below forelimb covered with granules; below hind limb anteriorly large smooth scales merging gradually into granules posteriorly. Type with 14 femoral pores.

Agreeing with characters common to all species as defined on p. 66; for scale and pore counts, see p. 69.

Color. In alcohol. Above, head grayish olive variegated with sepia; tip of snout to ear horn-yellow vertically striped with sepia on the lips; back olive brown with a vertebral series of coalescing pale spots which unite with others to form transverse series. Below, lower labials horny-gray indistinctly blotched with brown; throat, chest, belly, and beneath limbs plumbeous; neck, soles of feet, and tail horn-gray.

Size. Total length of type ♂ (M.C.Z. 46835), 221 (90 + 131) mm.

Remarks. I have not seen the Paratypes which are included on the basis of information kindly supplied by Mr. V. FitzSimons. Apparently lizards somewhat intermediate in character between *langi* and *subviridis* but nearer latter, occur at 7,000 feet on Mont aux Sources, for of Tvl. Mus. Nos. 13851-3 FitzSimons writes: "the scales on flanks are better developed, keeled and closer together, though still well separated by granular interspaces."

It should be added that all information below is based on the assumption that the lizards referred to in the above citations are truly *langi*.

Diet. Twice observed eating lichen from the rocks (Essex).

Parasites. Mites (*Ixodiderma inverta* and *I. pilosa*) described from this form by Lawrence.

Temperament. An active and wary lizard (Hewitt).

Habitat. From 11,000 feet down to 7,000 feet and lower at some points of Mont-aux-Sources, under rocks, but possibly a burrower according to Essex, who found one at the terminus of a sixteen-foot burrow in soft soil near the summit of Katberg.

*Localities.*¹ **Basutoland:** Drakensberg near Kokstad; Mont-aux-Sources; Morija; Nemahadi Police Camp; near Underberg at 6,000 feet. **Cape Province:** Amatola Mountains; Great Winterberg; Hogsback; Katberg; Malutsenyane; Thaba Puttua, Rabaneng Pass; Ugie.

*Range*². Basutoland to eastern Cape Province.

¹ As all localities, except those of type and paratypes, are taken from the literature they should be regarded with reserve.

² Unless referable to *P. m. melanotus*, the specimens from Doornkop, near Belfast, Transvaal, mentioned by Hewitt, should be added.

PSEUDOCORDYLUS MICROLEPIDOTUS MELANOTUS (Smith)

Plate 8, figs. 2-3

Plate 9, figs. 1-3

- 1838a. *Cordylus (Pseudocordylus) melanotus* A. Smith, Mag. Nat. Hist. (2), 2, p. 32: "Cape of Good Hope," later given as Hills near Orange River east of "Phillopolis," i.e. Phillipolis, Orange Free State.
- 1838a. *Cordylus (Pseudocordylus) sub-viridis* A. Smith, Mag. Nat. Hist. (2), 2, p. 33: "Cape of Good Hope," later given as Mountains behind Kaffirland and Natal.
1843. *Cordylus microlepidotus* vars. A. Smith, pl. xxv, figs. A-B; pl. xxvi; pl. xxx, figs. 3-3b (*melanotus*) and 4-4b (*subviridis*).
- 1891a. *Pseudocordylus microlepidotus* Matschie (not Cuvier), p. 606.
- 1905h. Boulenger, p. 253.
- 1907b. Roux, p. 422.
- 1908b. Boulenger, p. 224.
- 1909a. Hewitt (part), p. 37 (Transvaal, Orange Free State, Natal).
- 1910b. Boulenger (part), p. 469 (Natal only).
1920. Hewitt, p. 93.
- 1937a. *Pseudocordylus microlepidotus subviridis* FitzSimons, p. 266.
1943. *Pseudocordylus subviridis subviridis* FitzSimons (part, rest *langi*), p. 467.
1943. *Pseudocordylus subviridis transvaalensis* FitzSimons (? part, see *Remarks* below), *Lizards of South Africa*, p. 469: Woodbush, Pietersburg District, northern Transvaal.

Further citations of "*subviridis*" will be found under *langi*.

Description. Rostral separated from, or rarely in contact with, the frontonasal, which is as long as (M.C.Z. 46837), or shorter than, broad or longitudinally divided, sometimes with an azygous scale between it and the prefrontals (M.C.Z. 21274) or the nasals (M.C.Z. 21443); nostril pierced in the lower centre or postero-inferior corner of a nasal; median subocular descending to the lip between the fourth and fifth or fifth and sixth upper labials; postfrontals as long as broad or shorter than broad; upper row of temporals vertically elongate; gulars smooth, a few anterior ones irregularly enlarged, the median usually moderately or strongly elongated like the lateral.

Dorsum covered with small, flat or raised, subcircular or squarish, smooth or keeled, granular scales, forming more or less regular longitudinal and transverse series, those of the vertebral region smallest and more closely juxtaposed than the larger dorsolateral, which are separated by minute granules; scales on flanks subcircular or sub-

triangular, decreasing in size on lowest part of flanks and separated horizontally by granules interspersed with larger, flat, subcircular scales (*melanotus*) or each vertical series of scales juxtaposed (*subviridis*), the larger scales obtusely keeled (young) or smooth (adult); scales below fore limbs obtusely keeled or granular, below hind limbs smooth or obtusely keeled.

For characters common to all species, see definition on p. 66, for scale and pore counts, see statistical table on p. 69.

Color. Above, head brown variegated with yellow, tip of snout and lip to ear horn-yellow; back of male yellowish brown, brown, or black, with numerous spots in longitudinal series; back of female chequered with black and with series of elongated yellowish spots; both sexes with faint traces of obsolescent cross-bars descending to the flanks where they break up to form vertical bars; flanks yellow or orange yellow tinged with vermilion in male; sides of neck with one or two large black spots; limbs and tail handsomely barred or vermiculated with black. Below, gular region of male deep blue (sometimes extending up on to sides of head), of female yellowish infuscated with gray; belly greenish yellow tinged with vermilion; tail with dark cross-bars, the tip entirely black.

Size. Total length of a ♂ (M.C.Z. 14240), 273+ (120 + 153+) mm., from Forbes Reef, Swaziland, of a young ♀ (M.C.Z. 21274), 188 (88 + 100) mm., from Kastrol Nek, southeastern Transvaal.

Total length of ♂ (M.C.Z. 14241), 217 (97 + 120) mm., and ♀ (M.C.Z. 21443), 177 (88 + 89) mm., both from Giants Castle, Natal.

Remarks. Unfortunately the types of *melanotus* and *subviridis* are lost (FitzSimons, 1937a) and the present disposition must be regarded only as tentative. The precise status and ranges of the forms of this difficult group will not be settled until some South African herpetologist is able and willing to *assemble* all the material from the South African museums and subject them to intensive comparative study.

FitzSimons (1943, p. 464) places *melanotus* in the synonymy of *microlepidotus* which has small temporals. This is obviously wrong for Sir A. Smith's figure of *melanotus* (3b) shows it as having vertically elongate temporals like *subviridis* (4b). What FitzSimons calls *subviridis* (1943, p. 467) is a composite of *melanotus*, *subviridis* and *langi* spec. nov. That the name *subviridis* cannot be applied to the granular flanked *langi* (which is more closely related to *robertsi* than to any *microlepidotus*) is clear from Smith's statement that the flanks of *subviridis* are covered with keeled scales.

FitzSimons' figures of *subviridis* (figs. 373-374) from Giant's Castle

undoubtedly represent that form, which I am inclined to think may be separable as a southeast race on the basis of the almost contiguous, vertical (not horizontal) juxtaposition of the lateral scales. In the more northern form (*melanotus* + *transvaalensis*) such scales are separated both vertically and horizontally by granules and with or without small, scattered, subcircular scales. Where the two forms merge it is impossible for me to say, and instead of speculating I prefer to treat both as *melanotus* for the difference may not prove to be constant when a large series is studied.

FitzSimons (1943, p. 463) separates two forms as follows:

A single row of large vertically elongate temporals; lowermost temporal spine moderately projecting in males *s. subviridis*

Two rows of temporals, the upper vertically elongate and much larger than the subhexagonal lower; lowermost temporal spine feebly projecting and only bluntly pointed. . . . *s. transvaalensis*

Unfortunately these characters fail to separate our material in accordance with the supposed ranges. In the matter of temporals, not only do lizards from the same locality answer to both, but the temporals on one side of the head of an individual may correspond to the definition of *subviridis*, on the other to *transvaalensis*.

As for the degree of bluntness of the "temporal spine" i.e. lowest anteaureicular scale, its condition appears to be affected by age and the degree of wear to which it has been subjected in rocky crevices.

There is, however, a substantial size difference of about 80 mm. in total length as between the southern and extreme northern forms. FitzSimons gives the following:

♂ 255 (110 + 145) mm. from Giant's Castle, Natal.

♂ 327 (151 + 176) mm. from Woodbush, northern Transvaal.

The seven specimens in the Museum of Comparative Zoölogy come from localities indicated by an asterisk below.

Localities. **Transvaal:** Doornkop near Belfast; *Kastrol Nek Farm, Wakkerstroom; Pretoria District; *Selati (Paratype of *transvaalensis*); Zoutpansberg District. **Swaziland:** *Forbes Reef. **Natal:** Balgowan; *Giant's Castle, Drakensberg; mountains behind Kaffirland; Umvoti.

Range. Transvaal south through Swaziland to Natal, east to Orange Free State and eastern Cape Province.

* In Museum of Comparative Zoölogy.

PSEUDOCORDYLUS MICROLEPIDOTUS NAMAQUENSIS Hewitt

- 1903e. ?*Pseudocordylus microlepidotus* Boulenger (not Cuvier), p. 217.
 1909a. Hewitt (part), p. 37 (Richmond District record only).
 1927a. *Pseudocordylus microlepidotus namaquensis* Hewitt, Rec. Albany Mus.
 3, p. 392, pl. xxii, fig. 1: Namaqualand.
 1935. Lawrence, p. 44.

Description. Rostral separated from the frontonasal; upper row of temporals slightly vertically elongate; gulars smooth, the median more or less squarish or subcircular.

Dorsum covered with small, subequal, keeled, striate, nodular scales, forming more or less regular longitudinal and transverse series, those of the vertebral region smallest.

For characters common to all species, see definition on p. 66, for scale and pore counts, see statistical table on p. 69.

Color. Pattern not readily distinguishable. Below, gular region without infuscations.

Size. Length of type (S.A.M. 872) from snout to anus, 127 mm.

Remarks. Known to me only from the sketchy description and indistinct figure of the original citation, based on four specimens in the South African Museum. To these I have tentatively added, on geographical grounds only, Boulenger's (1903e) Deelfontein, Richmond District, record which was repeated by Hewitt (1909a) as *microlepidotus* at a time when none of the races were recognized. Whether *namaquensis* deserves recognition is uncertain though geographically probable.

Localities. **Cape Province:** Beaufort West; Deelfontein, 25 miles w. of Victoria West¹; Namaqualand (whether Little or Great not known).

Range. Western Cape Province (west to "Namaqualand").

PSEUDOCORDYLUS MICROLEPIDOTUS MICROLEPIDOTUS (Cuvier)

Plate 10, figs. 1-2

1735. *Lacerta Africana elegantissima* Seba, Rerum naturalium Thesauri
 2, p. 62, pl. lxii, fig. 6: Africa.
 1829. *Cordylus microlepidotus* Cuvier, Règne Animal, ed. 2, **2**, p. 33:
 (based on Seba's plate).
 1829-44. Guérin, Icon. Règne Animal, **1**, Rept., pl. vi, figs. 1-1a.

¹ See remarks.

- 1931b. Gray, p. 119.
 1843. Smith, A., (part), pl. xxiv, fig. 1 (= A of text), pl. xxx, figs. 1-1a:
 Table Mountain near Cape Town, Cape Province.
 1831b. *Zonurus microlepidotus* Gray, p. 63.
 1834. Schlegel, p. 216 (pl. is captioned *Wittii*).
 1839. Duméril & Bibron, p. 361. (omit Sierra Leone as error).
 1834. *Zonurus wittii* Schlegel, pl. vii, figs. 1a-1c (but text refers to
microlepidotus from) South Point of Africa.
 1838a. *Cordylus (Pseudocordylus) montanus* A. Smith, Mag. Nat. Hist. (2),
 2, p. 32: Cape of Good Hope.
 1845. *Pseudocordylus microlepidotus* Gray, p. 49.
 1884a. Rochebrune, p. 107 (omit Senegambia as error).
 1885e. Boulenger (part), p. 259.
 1898. Slater, p. 104.
 1898. Werner (1896-7), p. 140.
 1910b. Boulenger (part), p. 469. (Cape Town only).
 1910a. Hewitt, p. 71.
 1925b. Flower, p. 945.
 1926b. Rose, p. 492.
 1927a. Hewitt, p. 390, pl. xxiii, fig. 3.
 1929. Rose, pp. 102, 106, figs. 67-68.
 1935. Lawrence, p. 44.
 1931. *Zonurus pseudocordylus* (in error) Mann, pp. 390, 398.
 1939. Popp, p. 263.

Name. Crag Lizard (English: Rose).

Description. Rostral separated from, or rarely in contact with, the frontonasal, which is shorter or longer than broad; nostril pierced in the lower centre or postero-inferior corner of a nasal; median subocular descending to the lip between the fourth and fifth upper labials; post-frontals as long as broad; a few median and posterior temporals slightly vertically elongate; gulars smooth, the median more or less slightly elongate like the lateral.

Dorsum covered with small, flat or raised subequal, subcircular, smooth or obtusely keeled nodular scales, separated by minute granules, forming more or less regular longitudinal and transverse series, those of the vertebral region smallest; scales on flanks subequal, not decreasing in size appreciably, smooth or obtusely keeled; scales below forelimbs smooth, keeled or granular, below hind limbs smooth or granular.

For characters common to all species, see definition on p. 66, for scale and pore counts, see statistical table on p. 69.

Color. Above, head brownish red, lips and sides of head pale brown-

ish; back blackish or brownish red with series of ochre yellow spots which tend to form 7-8 cross-bars descending to the flank; where they may break up; sides of neck with one or two large blackish spots; limbs barred with yellow; tail narrowly streaked with yellow. Below, gular region black (Rose) or blue (Smith); belly dirty gray (Rose), yellowish or orange (Smith) tinged with red. Eyes chestnut brown (Smith).

Size. Total length 279 (221 + 58) mm. (Rose).

Remarks. I concur with Hewitt (1927a) that *montanus* was almost certainly the form (figured by Seba) on which Cuvier based his *microlepidotus* (without description).

Breeding. Four young are produced (Rose, *vide* Hewitt, 1937e).

Longevity. Two years, nine months, seven days (Flower).

Diet. This insectivorous lizard will eat even the spinous wingless locusts known as *korenkrekels* and at times vary their diet by taking lichen from the nearby rocks (Rose).

Parasites. Mites (*Ixodiderma inverta* and *Zonurobia semilunaris*) have been described from this form by Lawrence.

Enemies. One, when seized by a hawk, freed itself by discarding its tail, but was killed by the fall to the rocks below (Rose).

Temperament. When first captured this lizard can, and will, inflict a severe bite. In captivity it soon becomes docile, however, and will even take food from the fingers (Rose).

Habitat. Confined to the steeper crags from whose deep clefts it can be secured only by a noose at the end of a long wire (Rose).

Localities. Cape Province: Table Mountain and hills near Cape Town.

Range. Cape Province (mountains of Cape Peninsula).

PSEUDOCORDYLUS MICROLEPIDOTUS FASCIATUS (Smith)

Plate 10, figs. 3-4

Plate 11, figs. 1-2

1838a. *Cordylus (Pseudocordylus) fasciatus* A. Smith, Mag. Nat. Hist. (2), 2, p. 32: Cape of Good Hope.

1843. Smith, A., pl. xxvii, fig. 1; pl. xxx, figs. 5-5b: Rocky Hills near Grahamstown, Cape Province.

1838a. *Cordylus (Pseudocordylus) Algoensis* A. Smith, Mag. Nat. Hist. (2), 2, p. 32: Cape of Good Hope.

1843. *Cordylus microlepidotus* A. Smith, (not Cuvier) pl. xxiv, fig. 2; pl. xxx, figs. 2-2b: Algoa Bay, Cape Province.

- 1927a. *Pseudocordylus fasciatus* Hewitt, p. 391.
 1935. Lawrence, p. 44.
 1937e. Hewitt, p. 31, pl. x, fig. 1.
 1937a. *Pseudocordylus microlepidotus fasciatus* FitzSimons, p. 266.

Names. Crag Lizard or caiman (English); *kaaiman*, or sometimes *klip-lekkevan* (Afrikaans); *uroqotyeni* (Hottentot; = always on the stone). All taken from Hewitt (1937e).

Description. Rostral separated from, or rarely in contact with, the frontonasal, which is as long as broad; nostril pierced in the lower centre or postero-inferior corner of a nasal; median subocular descending to the lip between the fourth and fifth upper labials; postfrontals as long as broad or longer than broad; temporals polygonal, not vertically elongate; gulars smooth, a few anterior ones irregularly enlarged, the median more or less squarish.

Dorsum covered with small, raised, subcircular or subtriangular, feebly keeled (young) or smooth (adult) nodular scales, separated by minute granules, forming more or less regular longitudinal and transverse series, those of the vertebral region smallest; scales on flanks subequal, not decreasing in size appreciably, obtusely keeled; scales below fore limbs smooth or striate, below hind limbs smooth.

For characters common to all species, see definition on p. 66, for scale and pore counts, see statistical table on p. 69.

Color. Above, head brown variegated with yellow, lip to ear yellow or more or less tinged with red; back blackish brown, brown, or reddish brown, with 6-10 series of pale yellow spots¹ or bands²; sides of neck with one or two large blackish spots; flanks yellow, orange yellow, or brick red, without vertical bars, at most the dorsal bands encroaching but slightly; tail irregularly spotted with yellow. Below, yellowish tinged with reddish.

Size. Total length of ♂ (M.C.Z. 33449), 304+ (144 + 160+) mm., tail-tip missing.

Remarks. FitzSimons (1937a) was unable to locate the type. It is possible that *algoensis* (including Matschie, 1891a) may prove to be distinct and have to be removed from the synonymy.

Anatomy. Hewitt (1920) discusses the so-called branchial arch.

Dict. Beetles, crickets, grasshoppers, wood-lice, snails, and even small lizards (Essex in Hewitt, 1937e).

Parasites. Mites (*Irodiderma inverta* and *Zonurobia semilunaris*) were found on this form by Lawrence.

¹ Only 1 or 2 orange spots on Abbotsbury males, whose females are more or less cross-barred.

² Bands complete in Butterworth lizards (Hewitt).

Temperament. An active but shy lizard which keeps close to its rocky retreat, basking with forepart upraised, the head and chin held high.

Habitat. Occurs at 5600 feet at Abbotsbury among the rocks on mountain slopes (Hewitt).

Localities. **Cape Province:** Abbotsbury near Lett's Kraal; Algoa Bay¹(?); Butterworth; Coetzee's Berg near Pearston; Dordrecht; Grahamstown — rocky hills in vicinity; Schurftberg, Somerset East District; Tsomo.

Range. Cape Province (eastern part).

GENUS PLATYSAURUS

1844. *Platysaurus* A. Smith, Ill. Zool. S. Africa, Rept., footnote to pl. xi (type *capensis* Smith).

Head and body depressed; limbs well developed; tail moderate. Head shields regular; nostril pierced in the nasal²; eyelids well developed, the lower with a transparent disk; ear-opening large; 4 parietals; a collar fold, attached mesially, at least indicated; dorsals granular; sides of neck covered with granules; ventrals moderate, quadrangular, juxtaposed, imbricate, forming longitudinal and transverse series; femoral pores present in both sexes though sometimes scarcely distinguishable in females; digits slightly keeled inferiorly; tail with or without spines.

The seven forms which I have examined appear to have the following characteristics in common, consequently these have been omitted from the specific descriptions.

Head much longer than broad; head shields more or less smooth or slightly roughened posteriorly; rostral once and a half to twice and a half as broad as high; nasal not or scarcely swollen; a postnasal; a loreal; a preocular; 4 suboculars of which one or two descend to the lip between the labials; 4 supraoculars, the anterior longest, the second broadest; prefrontals forming a suture; frontal hexagonal, broader anteriorly; posterior parietals much larger than the anterior; mental rather large; lower labials bordered by a row of 5 large shields; collar scales enlarged but otherwise undifferentiated.

Dorsal granules small, flat or but slightly convex; median preanals more or less enlarged; limbs below with smooth (some keeled in

¹ Unless *algoensis* proves to be a recognizable form. Abbotsbury lizards are not quite typical according to Hewitt (1927a).

² Not between "nasal and first labial" as stated by Boulenger, the nostril being actually separated from labial and postnasal by a narrow rim.

g. guttatus and *g. rhodesianus*) scales which on tibia form a series of from 6-10 large plates; claws of the adressed hind limb reach to axilla or shoulder, rarely neck, in *guttatus* and its races, to neck (♀) or temporal region (♂) in *capensis*, there being a tendency to shorter limb length in females; tail with whorls of elongate, quadrangular, rugose or keeled scales, the lateral with strongest keels, the subcaudals smooth.

Range. South Africa, on east north to the Zambezi, i.e. south of 16° S.

Remarks. An examination of the Statistical Synopsis of Variation will reveal the homogeneity of this group, rendering the compilation of a Key extremely difficult. Even so I imagine that when large series of certain forms are available apparent differences in scale-counts will overlap still more. I should like to see a Key based solely on the striking color differences of these various montane forms.

Key to the Species

1. A large occipital wedged between the posterior parietals; sides of neck covered with small *and* enlarged granules; granules on flanks distinctly enlarged; scales covering limbs above mostly rugose *and* strongly keeled; adressed hind limb reaches axilla or shoulder (except in *guttatus fitzsimonsi* where it attains neck); range: southeastern Africa 2
 No occipital, at most 4-6 small scales mesially behind parietals; sides of neck covered with small subuniform granules; granules on flanks minute or but slightly enlarged; scales covering limbs above smooth or feebly keeled; adressed hind limb reaches neck or temporal region; range southwestern South Africa 8
2. Adult length from snout to anus more than 90 mm. 3
 Adult length from snout to anus less than 80 mm. 5
3. Rostral *usually* in contact with frontonasal; inter-parietal *usually* separated from occipital; collar scales 6-7; ventral plates in 16-20 longitudinal and 39-45 transverse rows (*from collar*); length from snout to anus of adults *usually* less than 100 mm.; range: northern Transvaal *g. guttatus* (p. 89)
 Rostral *usually* separated from frontonasal; inter-parietal *usually* in contact with occipital; collar scales 7-12; ventral plates in 18-26 longitudinal and 40-48 transverse rows (*from collar*) 4

- 4 Supraciliaries 4; enlarged temporals in 2 rows, upper largest; chin and throat very light blue without markings, belly and limbs below *not* uniformly dark blue; adult length from snout to anus over 100 mm.; range: Southern Rhodesia and Bechuanaland Protectorate. *g. rhodesianus*
(p. 86)
- Supraciliaries 5; enlarged temporals in 3 rows, median largest; chin and throat to chest of adult male entirely black spotted with pale blue, belly and limbs below uniformly dark blue; adult length from snout to anus 91 mm.; range: Lydenburg, eastern Transvaal. *g. filzsimonsi*
(p. 88)
5. Some dorsals in the vertebral series very slightly enlarged; lower surface in both sexes dark. 6
Dorsals subuniform; lower surface in both sexes light but males with dark patches on belly. 7
6. Interparietal forming a suture with a small occipital which may be broken up; spines on tibia towards heel poorly developed, on lateral caudals not at all; chin and throat of male gray green with black markings; edges of light lines on dorsum of female sharply defined; range: Tete, Mozambique. *g. torquatus*
(p. 91)
- Interparietal forming a suture with an occipital as large as itself; spines prominent both on tibia towards heel and on lateral caudals; chin and throat of male black; edges of light lines on dorsum of female blurred; range: Barberton, Transvaal and Ubombo, Zululand. *g. wilhelmi*
(p. 92)
7. Males above, olive brown to reddish brown with light spots on dorsum arranged in longitudinal lines; in females such light spots are arranged in longitudinal lines also, but no black spots present on abdomen; flanks buff; range: Waterberg, Transvaal. *g. minor*
(p. 93)
- Males above, dull green to bluish green with light spots on dorsum scattered; in females such light spots are absent or only present posteriorly; but irregular black spots are present on abdomen; flanks dull green to bluish green; range: eastern face of Drakensberg, Transvaal. *g. orientalis*
(p. 94)
8. Range: Little Namaqualand and Victoria West, Cape Province north to South West Africa. *capensis*
(p. 96)

Species or race	Rostral breadth into height	Supraoculars	Supraciliaries	Suboculars	Upper labials anterior to subocular	Lower labials	Collar scales	Longitudinal ventral rows	Transverse ventral rows from collar	Femoral pores
<i>g. rhodesianus</i>	2-2½	4	4	4	4-5	5-6	7-12	18-26	40-48	19-25
<i>g. fitzsimonsi</i>	2	4	5	4	4	4-5	10	20	45	20-21
<i>g. guttatus</i>	2	4	4	4	4-5	5-6	6-7	16-18	39-40	16-20
<i>g. torquatus</i>	2	4	4	4	4-5	5-6	6	16-18	37	17-21
<i>g. wilhelmi</i>	2	4	4	4	4-5	5	6-8	18-20	37-39	18-20
<i>g. minor</i>	2	4	4	4	4-5	4-5	6-8	16-18	34-38	15-17
<i>g. orientalis</i>	2	4	—	—	—	—	—	20-22	38	14-20
<i>cupensis</i>	1½-2	4	4-5	4	5-6	5-6	8-11	20	40-50	15-19

PLATYSAURUS GUTTATUS RHODESIANUS FitzSimons

- 1902b. *Platysaurus guttatus* Boulenger (not A. Smith), p. 16.
 1909a. Chubb, p. 593.
 1909b. Chubb, p. 35.
 1909a. Hewitt (part), pp. 29, 38.
 1913. Hewitt & Power, p. 154.
 1930. FitzSimons (part), p. 31.
 1932. Hewitt (part), p. 118.
 1935b. FitzSimons, p. 350.
 1939b. FitzSimons, p. 31.
 1910b. *Platysaurus capensis* Boulenger (part), p. 469.
 1934. Pitman, p. 304.
 1941. *Platysaurus guttatus rhodesianus* FitzSimons, Ann. Transvaal Mus.,
 20, p. 279: Vumba Mountain, Southern Rhodesia.

Description. Rostral sometimes in contact with, though more usually separated from, the frontonasal, sometimes by an azygous scale; frontonasal as long as broad or shorter than broad; second or second and third subocular descending to the lip; interparietal large, pentagonal, rarely diamond-shaped, rarely enclosed between 2 pairs of parietals, usually forming a suture with an occipital; enlarged temporals in 2 longitudinal rows, upper largest; sides of neck covered with granules, both small and enlarged; gulars small, elongate, those on the median line more or less enlarged and squarish; granules on flanks enlarged; limbs above with granules and rugose, strongly keeled scales.

For characters common to all species, see definition on p. 82, for scale and pore counts, see statistical table on p. 85.

Color. ♂. Above, head and back dull bluish green with three light longitudinal lines usually discernible on head, indicated or disappearing on back in old males, which may be almost uniform, lacking the light spotting displayed on back and limbs of young; flanks terra cotta in life; base of tail dull reddish yellow or yellowish green passing distally to green. Below, chin and gular region light blue (yellow to greenish yellow in young); a black gular collar sometimes extending to chest (much reduced and narrower in young); belly anteriorly terra cotta (in life) (blue in young), posteriorly dark grayish blue to black; limbs blue to dark blue; tail tangerine (in life) or straw color (in alcohol), passing distally to yellow, yellowish green, and finally green (yellow at base passing to green in young).

In life, according to FitzSimons, from whom this description is

largely adapted, very young males, though otherwise marked much like the females, display a terra cotta colored patch on the chest.

♀. Above, head and back dark brown or black with three sharply defined white to yellowish longitudinal lines, between which are rarely (Matopos), more usually *are not*, pale spots; flanks and limbs with pale spots; tail whitish with a dusky median line anteriorly. Below, bluish white to bluish gray, chin and gular region sometimes exhibiting a faint bluish tinge; belly anteriorly sometimes pinkish, middle of belly usually with a large bluish black patch or spotted with black; base of tail sometimes pinkish, otherwise straw to whitish.

Size. Total length of type ♂ (T.M. 18528), 272 (105 + 167) mm., and paratype ♀ (T.M. 18663), 241 (92 + 149) mm.

Remarks. FitzSimons (1935b) shows that in 8 of his 14, and (1939b) in 9 of his 31 specimens (which later became the type series), the rostral is in contact with the frontonasal, while in 4 out of 14 and 9 out of 31 the interparietal is separated from the occipital. Hewitt (1909a) found that 1 out of 10 lizards displayed an interparietal forming a wide suture with the occipital.

Parasites. Mites (*Zonurobia circularis typicus*) described by Lawrence from Salisbury "*guttatus*".

Habitat. On the granite hills about Zimbabwe this lizard is found in association with *Agama kirkii*, *Mabuya q. margaritifer*, and *Gerrhosaurus v. validus*, elsewhere, though found in association with *margaritifer* in the bushveld, the latter was not observed on the lower slopes of Vumba Mountain where *P. g. rhodesianus* was encountered, and from where the Museum of Comparative Zoölogy has a good series of topotypes collected by Mr. V. FitzSimons at the same time as the type.

Localities. **Southern Rhodesia:** Bikita; Bindura; Changadzi River; Chilimansi; Chishagwasha; Devuli River; Driefontein; Empandeni; Gwanda; Hunyani River; Importuni District; Insiza; Khami River; Livingstone; Lomagundi District; Matabeleland; Matopos Hills; Mazoe; Mtoko; Mount Silozi; Penahlonga; Plumtree; Salisbury District; Strathmore near Bulawayo; Vumba Mountain; World's View; Zimbabwe. **Bechuanaland Protectorate:** Tsessebee.

Range. Southern Rhodesia extending into northeast Bechuanaland Protectorate. (As yet there is no evidence of the occurrence of any *Platysaurus* in *Northern Rhodesia* so that Pitman's (1934) suggestion that *capensis* may occur there, lacks foundation, for the genus appears to be found south of the Zambezi only).

PLATYSAURUS GUTTATUS FITZSIMONSI subsp. nov.

Type. Museum of Comparative Zoölogy, No. 8982, an adult ♂ from Lydenburg, Transvaal, received in exchange from the British Museum, 1913.

Diagnosis. As given in preceding key to the races of *guttatus*. To which one might add that from *g. wilhelmi*, the only other member of the genus whose male has the whole undersurface either black or blue, *fitsimoni* differs in the pale blue spotting of its chin and jaws, and the very dark blue (instead of light blue) undersurface of body and limbs. Also in its three rows of temporals; smooth (not strongly keeled) plates on the upper anterior surface of hind limb; subuniform character of dorsal granules; more numerous transverse rows of ventrals; larger size, etc. etc.

Description. Head much longer than broad; rostral twice as broad as high, separated from the frontonasal, which is shorter than broad; nostril pierced in the postero-inferior corner of the nasal; a postnasal; a loreal; a preocular; 4 suboculars, the second descending to the lip; 4 upper labials anterior to subocular; 4 supraoculars, the anterior longest, the second broadest; 5 supraciliaries; prefrontals forming a suture; frontal hexagonal, broader anteriorly; a pair of postfrontals; interparietal large, pentagonal, forming a suture with an occipital; posterior parietals much larger than the anterior; enlarged temporals in three longitudinal rows, the median largest; sides of neck covered with granules, both small and enlarged; mental rather large; 4-5 lower labials, bordered by a row of 5 large shields; gulars small, elongate, those on the median line slightly enlarged and squarish; collar scales 10, the ill-defined collar fold attached mesially.

Dorsum covered with small, flat, granular scales, subequal; granules on flank enlarged; ventrals moderate, squarish or slightly broader than long, smooth, juxtaposed, forming 20 longitudinal and 45 transverse rows (from collar); median preanals enlarged; limbs above with granules and rugose, strongly keeled scales, limbs below with enlarged smooth scales which on tibia form a series of 7 large plates; claws of adpressed hind limb reach to neck; 20-21 femoral pores; tail with whorls of elongate, quadrangular, rugose or keeled scales, keels on the lateral strongest, only some of the subcaudals smooth.

Color. ♂ Above, head dark blue (? green in life) with three light longitudinal lines; back pale blue (? green in life) uniform or with a few faintly discernible light spots; limbs pale blue, the hind limbs

brown posteriorly; tail straw yellow (? red in life). Below. chin and gular region deep black flecked with light blue, merging with black of collar; belly and limbs uniformly bright ultramarine blue; tail straw yellow.

Size. Total length of type ♂ (M.C.Z. 8982), 226 (91 + 135) mm.

Remarks. This appears to be the most southern form of the larger races of *guttatus*. The only possible reference to it in the literature may be that of Hewitt (part, 1932, p. 119) where he writes of *guttatus* ranging as far south as White River, Barberton District.

Localities. **Transvaal:** Lydenburg (possibly also White River)

Range. Eastern Transvaal (Lydenburg District).

PLATYSAURUS GUTTATUS GUTTATUS Smith

1849. *Platysaurus guttatus* A. Smith, Ill. Zool. S. Africa, Rept. App., p. 8:
Limpopo River near the Tropic of Capricorn.
- 1882a. Peters, p. 52.
- 1885e. Boulenger, p. 262.
1898. Slater, p. 104.
- 1907j. Boulenger, p. 484.
- 1909a. Hewitt (part), pp. 29, 38.
1910. Hewitt, pl. i, fig. 1 (for 1909a).
- 1911b. Hewitt, p. 48.
1930. FitzSimons (part), p. 31.
1935. Broom, p. 20, fig. 5c.
1935. Lawrence, p. 44.
- 1937a. FitzSimons, p. 266.
1938. Gorham & Ivy, p. 179.
- 1891a. *Platysaurus intermedius* Matschie, Zool. Jahrb. Syst., 5, p. 606:
Mphome, Zoutpansberg District, Transvaal.
- 1911c. Sternfeld, p. 419 (Mpoma).
- 1910b. *Platysaurus capensis* Boulenger (part, not Smith), p. 469 (Pietersburg only).

Further citations of "*guttatus*" will be found under its various races and *capensis*.

Description. Rostral usually in contact with, though sometimes separated from, the frontonasal, which is shorter than broad; second and third subocular descending to the lip; interparietal large, diamond-shaped, rarely pentagonal, enclosed between 2 pairs of parietals, rarely forming a suture with an occipital, which may be transversely divided; enlarged temporals in 2 longitudinal rows, upper largest; sides of neck

covered with granules, both small and enlarged; gulars small, elongate, those on the median line much enlarged, squarish or polygonal; granules on flanks enlarged; limbs above with granules and rugose, strongly keeled scales.

For characters common to all species, see definition on p. 82, for scale and pore counts, see statistical table on p. 85.

Color. ♂. Above, head brown; back bluish green to pale brownish red, with or without three light longitudinal lines, between which are irregular longitudinal series of light spots; flanks like back with faint spotting; base of tail pale orange or yellowish with or without a dusky median line. Below, chin and gular region light blue with or without blackish, or deep purplish brown, markings; a black gular collar; belly anteriorly pale blue, posteriorly dark blue; hind limbs blue though posteriorly like tail, straw yellow.

♀. Above, head and back olive brown with three rather poorly defined light longitudinal lines, between which are two longitudinal series of pale spots; flanks and limbs with pale spots; tail straw yellow, anteriorly with a dusky median line. Below, bluish white to blue; chin and gular region tinged with blue and marked with black; belly anteriorly pale blue, middle of belly usually with a large dark bluish black patch; tail straw yellow.

Size. Total length of ♂ (M.C.Z. 21231), 217 (84 + 133) mm., exceeded in length from snout to anus by one of 105 mm. from the same locality—Woodbush; length of type ♀ (Brit. Mus.), 165 (71 + 94) mm., exceeded in length from snout to anus by one of 87 mm. (Boulenger, 1907j).

Anatomy. The temporal region of the skull is discussed by Broom, the gall bladder by Gorham and Ivy.

Parasites. Mites (*Zonurobia circularis typicus*) recorded from this race by Lawrence.

Localities. **Transvaal** Blyde River; Dwars River; Gerlachshoop, Elands River; Gravelotte; Haenertsburg; Jachtsdrift; Koedoes River; Letaba Drift; Leydsdorp; Limpopo River near Tropic of Capricorn; Mokeetsi; Mphome or Mpoma; Nwanedsi River; Pietersburg; Shilowane; Woodbush; Zoutpansberg. (Hewitt's (1932) record of White River, Barberton District, is tentatively removed to the race *fitzsimonsi* His (1909a) record from Victoria West, Cape Province was based on a *capensis* Mr. FitzSimons informs me.

Range. Northern Transvaal (Zoutpansberg region).

PLATYSAURUS GUTTATUS TORQUATUS Peters

Plate 11, fig. 3

1854. *Platysaurus capensis* Peters (not A. Smith), p. 616.
 1855. Peters, p. 45.
 1854. *Platysaurus guttatus* Peters (not A. Smith), p. 616.
 1855. Peters, p. 45.
 1879a. *Platysaurus torquatus* Peters, Sitz. Ges. naturf. Freunde Berlin, p. 10: Tete, Mozambique.
 1882a. Peters, p. 52, pl. ixa.
 1885e. Boulenger, p. 262.
 1896a. Bocage, p. 98.
 1907j. Boulenger, p. 484 (comments on).
 1909a. Hewitt, pp. 31, 38.
 1910a. Hewitt, p. 60.

Native name. *Búnio* (at Tete: Peters).

Description. Rostral in contact with, or separated from, the frontonasal, which is shorter than broad; second and third subocular descending to the lip; interparietal large, diamond-shaped, forming a suture with an occipital which may be broken up; enlarged temporals in 2 longitudinal rows, upper largest; sides of neck covered with granules both small and enlarged; gulars small, elongate, those on the median line slightly enlarged and squarish; granules on flanks enlarged; limbs above with granules and rugose, strongly keeled scales.

For characters common to all species, see definition on p. 82, for scale and pore counts, see statistical table on p. 85.

Color. ♂. Above, head and back black with three light (golden yellow in life) longitudinal lines on head, the lateral disappearing on back, flanking the vertebral line is a regular longitudinal series of light spots; flanks malachite green spotted with lighter; limbs dark brown spotted with rusty yellow; tail pale orange yellow (red in life). Below, chin and gular region gray green with black markings; a black gular collar; tail yellow (red in life).

♀. Above, head and back brownish black with three sharply defined, light, longitudinal lines between which are a longitudinal series of light spots; flanks grayish or brownish green; tail greenish gray (not red) with a median dusky line anteriorly. Below, chin and gular region bluish green; (?) a black gular collar; belly gray; tail gray brown.

Size. Total length of cotype ♂ (Berlin Mus.), 185 (72 + 113) mm., of cotype ♀ (M.C.Z. 37203), 161 (68 + 93) mm.

Remarks. It is just as well that Peters (1882a) described this lizard in great detail for no other specimens of it have been taken. He points out that in 1854 he referred the males to *guttatus*, the females to *capensis*: twenty-five years later he used the same material as types of *torquatus*.

Boulenger (1885e), doubtless misled by Peter's figure for he had no material, erred in saying that the gulars on the median line were not enlarged for Peters definitely says that two rows are enlarged (two, or possibly three in our cotype), though his figured specimen shows but slight enlargement and that only in the basal part. Hewitt (1909a) is equally mistaken in suggesting that *torquatus* can be separated from *capensis* on the grounds that the former has two and the latter only one median row enlarged, for in most of the forms much variation is displayed in this character.

Boulenger (1907j) points out that *guttatus* has from 70-90 dorsal granules in longitudinal series while *torquatus* has from 90-100. This is a character worthy of study in all the forms and one to which I have paid no attention.

Anatomy. Utilising *C. c. cordylus* for comparative purposes, Peters (1882a) discusses the viscera, skeleton, and skull of *torquatus*, stating that the latter has 20 teeth in the upper, 21 in the lower jaw; that the pupil is round, and that no lateral fold is present in life.

Habits. He claims that it is difficult to capture owing to the agility with which this lizard seeks shelter in the rock crevices, from which it can be taken only by removal of the rocks.

Habitat. It is to be found on the carbonaceous sandstone rocks between the Caruera Mountains and Tete, also a few miles north and southwest of Tete.

Localities. **Mozambique:** Tete, south bank of the Zambezi.

Range. Mozambique.

PLATYSAURUS GUTTATUS WILHELMI Hewitt

- 1908b. *Platysaurus guttatus* Boulenger (not A. Smith), p. 224.
 1909a. *Platysaurus wilhelmi* Hewitt, Ann. Transvaal Mus., 2, p. 29, Nelspruit, Barberton District, Transvaal.
 1910. Hewitt, pl. i, fig. 2 (for 1909a).
 1911b. Hewitt, p. 48.
 1930. FitzSimons (part), p. 32.
 1932. Hewitt (part), p. 119.
 1935. Lawrence, p. 44.

Further citations of "*wilhelmi*" will be found under *g. orientalis*.

Description. Rostral in contact with the frontonasal, which is as long as broad or shorter than broad; second subocular descending to the lip; interparietal large, pentagonal, forming a suture with an occipital; enlarged temporals in 2 longitudinal rows, upper largest; sides of neck covered with granules, both small and enlarged; gulars small, elongate, those on the median line much enlarged and squarish; granules on flanks enlarged; limbs above with granules and rugose, strongly keeled scales.

For characters common to all species, see definition on p. 82, for scale and pore counts, see statistical table on p. 85.

Color. ♂. Above, head brown with three light longitudinal lines; back dull greenish with ill-defined light spots; flanks greenish, uniform; limbs dark variegated with lighter; tail straw yellow (red in life). Below, chin to chest deep black; belly ultramarine with some black mesially; limbs ultramarine; tail straw yellow (red in life).

♀. Above, head and back brownish black with three rather poorly defined light longitudinal lines, between which are a single, or posteriorly double, series of light spots; flanks and limbs with pale spots; tail terra cotta with a dusky median line anteriorly. Below, black or blackish gray; tail gray brown (pinkish in life).

Size. Total length of cotype ♂ (T.M.), 194 (82 + 112) mm., and ♀ (T.M.), 184 (66 + 118) mm.

Remarks. Hewitt (1909a) differentiated the adult male *wilhelmi* from *guttatus* by reason of its alleged broader head and heterogeneous dorsal granules which, in the female also, show some enlargement along the vertebral and dorsolateral lines. The character of the occipital scale he (1911b) later dropped from the diagnosis. It is more likely to be confused with *P. g. fitzsimonsi* under which race the points of difference are enumerated.

Parasites. Mites (*Zonurobia circularis transvaalensis*) are recorded by Lawrence.

Localities. **Transvaal:** Nelspruit; Queen's River (both in Barberton district). **Zululand:** Ubombo.

Range. Eastern Transvaal south to Zululand.

PLATYSAURUS GUTTATUS MINOR FitzSimons

1930. *Platysaurus guttatus minor* FitzSimons, Ann. Transvaal Mus., 14, pp. 30, 31, fig. 10: Vygeboompoort, Waterberg District, northern Transvaal.

1935. Lawrence, p. 44.

Description. Rostral separated from the frontonasal, which is shorter than broad; second or second and third subocular descending

to the lip; interparietal large, diamond-shaped or pentagonal, sometimes separating the anterior parietals, sometimes *anteriorly* in contact with a small azygous scale, or posteriorly forming a suture with an occipital; enlarged temporals in 2 longitudinal rows, upper largest; sides of neck covered with granules, both small and enlarged; gulars small, elongate, those on the median line enlarged, squarish or irregular; granules on flanks enlarged; limbs above with granules and rugose, strongly keeled scales.

For characters common to all species, see definition on p. 82, for scale and pore counts, see statistical table on p. 85.

Color. ♂. Above, head and back olive green with three light longitudinal lines, indistinct on head and tending to break up or disappear on back, between the lines are longitudinal series of light spots; flanks buff; tail terra cotta. Below, chin to collar vivid blue; belly dark prussian blue extending on to base of tail, rest of tail salmon buff.

♀. Above, head and back dark olive brown with three sharply defined light longitudinal lines, between which are one or two longitudinal series of light spots; flanks and limbs with pale spots; tail terra cotta with a broad, dusky, median line anteriorly. Below, chin, gular region, chest and belly whitish (pale blue in life), uniform; tail gray brown.

Size. Total length of cotype ♂ (T.M. 2109), 158 (65 + 93) mm. of cotype ♀ (T.M. 2367), 146 (61 + 85) mm.

Remarks. Of 135 specimens examined by FitzSimons not one exceeded 160 mm. in total length, the race was based on 73 specimens of which four are now M.C.Z. 41882-5. Of these 73 apparently about 44 possessed anterior parietals which were separated by the interparietal. The form is a perfectly good montane race though no great reliance should be placed on the scale characters originally cited by FitzSimons, for most will be found to vary widely within certain limits.

Parasites. Mites (*Zonurobia circularis spiniventer*) were described from this form by Lawrence.

Localities. **Transvaal:** Geelhoutkop; Modder Nek; Nylstroom; Palala River; Vgeboompoort.

Range. Transvaal (Waterberg District).

PLATYSAURUS GUTTATUS ORIENTALIS FitzSimons

1930. *Platysaurus wilhelmi* FitzSimons (part, not Hewitt), p. 32.
 1932. Hewitt (part, not Hewitt of 1909a), p. 119.
 1941. *Platysaurus minor orientalis* FitzSimons, Ann. Transvaal Mus., 20, p. 280: Sekororo on lower slopes of Drakensberg about 40 miles from Leydsdorp, Transvaal.

Description. Known to me only from the original description, which was based on three males and a female, and took the form of contrasting with *minor*. These differences are given without comment.

Snout more sharply pointed; head more swollen in temporal region and in general a little larger in proportion to the body; granules in temporal region in 2-3 longitudinal rows (as against 3-4 in *minor*); gular scales across throat between last large sublabial on either side 19-22 (as against 16-18 in *minor*); ventrals in 20-22 longitudinal (as against 16-18 in *minor*) and 38¹ transverse (as against 34-38¹ in *minor*) rows; femoral pores 14-20 (as against 14-17 in *minor*) preceded by modified glandular scales arranged in 2-3 rows (as against a single row in *minor*); scales on forearm and tibia more strongly keeled and spinose, especially on heel where the spines are long and strongly pointed; upper caudals obtusely keeled (more or less smooth in *minor*), lateral caudals strongly keeled and sharply spinose (moderately keeled and not or but bluntly spinose in *minor*).

For characters common to all other races which I have examined, see definition on p. 82, for scale and pore counts, see statistical table on p. 85.

Color ♂. Above, head and back bluish green to dull green with three light longitudinal lines on head only; back with small irregularly scattered light spots; flanks dull green to bluish green. Below, chin and gular region blue passing to dark blue or bluish black on belly.

♀. Above, head and back very dark brown or black with three sharply defined light longitudinal lines, between which are *no light spots* except for a few posteriorly. Below, bluish white with scattered irregular black spots.

Size. Total length of type ♂ (T.M. 4527), 180 (65 + 115) mm.

Localities. **Transvaal:** Dientje Farm, near Vaalhoek, Pilgrim's Rest District; Perkoe Farm, near Olifant's River; Sekororo, 40 miles south of Leydsdorp.

Range. Transvaal (eastern slopes of Drakensberg).

¹ Counting from collar to within three or four rows of preanals, in contrast to method employed by FitzSimons.

PLATYSAURUS CAPENSIS Smith

1844. *Platysaurus capensis* A. Smith, Ill. Zool. S. Africa, Rept. pl. xl: Great Namaqualand, South West Africa.
1845. Gray, p. 49.
- 1885e. Boulenger, p. 261.
1898. Sclater, p. 104.
- 1909a. Hewitt, pp. 31, 38.
- 1910b. Boulenger (part), p. 469.
- 1911b. Hewitt, p. 48.
- 1911b. Sternfeld, p. 403.
- 1911d. Sternfeld, p. 23.
1932. Hewitt, p. 118.
- 1935a. FitzSimons, p. 534.
1935. Lawrence, p. 44.
- 1937a. FitzSimons, p. 266.
1938. FitzSimons, p. 193.
- 1909a. *Platysaurus guttatus* Hewitt (part, not Smith), pp. 31, 38 (Victoria West record).

Further citations of "*capensis*" will be found under *g. rhodesianus*, *g. guttatus* and *g. torquatus*.

Description. Rostral rarely in contact with, usually separated from, the frontonasal, sometimes by an azygous scale; frontonasal as long as broad, sometimes with an azygous scale posteriorly; second or second and third subocular descending to the lip; sometimes a prefrontal also descending to the lip between loreal and preocular; interparietal large, diamond-shaped, enclosed between 2 pairs of parietals; occipitals broken up or absent; enlarged temporals in 2 longitudinal rows, upper largest; sides of neck covered with small granules only; gulars small, elongate, those on the median line more or less enlarged and squarish; granules on flanks minute or but slightly enlarged; limbs above with granules and smooth or feebly keeled scales.

For characters common to all species, see definition on p. 82, for scale and pore counts, see statistical table on p. 85.

Color. ♂. Above, head and back bright green anteriorly passing to dull orange on posterior third, with or without three light longitudinal lines on head which tend to disappear on back; between the lines some ill-defined light spots may be present or absent; flanks greenish blue and orange; tail yellow ringed with brown, a dusky median line anteriorly. Below, chin and gular region bright blue; belly anteriorly dark blue, in middle black, posteriorly whitish; limbs and tail pale straw yellow (grenadine in life), the latter ringed with darker.

♀. Above, head and back very dark brown with three well-defined light longitudinal lines, between which there are *no* light spots; flanks and limbs with obsolete pale spots; tail yellow alternately ringed with pale brown, a dusky median line anteriorly. Below, whitish, belly with or without pale blue and pinkish suffusions and a small black patch; tail straw yellow ringed with gray brown.

The above descriptions are adapted largely from FitzSimons (1935a), for more details of color variation see the same author for 1938.

Size. Total length of ♂ (T.M. 15883), 207 (78 + 129) mm., of type ♀ (Brit. Mus.), 197 (77 + 120) mm.

Remarks. FitzSimons (1937a) has reexamined and confirmed the identity of the ♀ holotype in the British Museum. Boulenger (1910b) was in error in synonymizing *guttatus* with this species, a fact soon pointed out by Hewitt (1911b) who, in 1932, listed many distinguishing characters though some have not stood the test of larger series. Peters (1882a) states that the dorsal granules are in 80-84 rows.

Parasites. Mites (*Zonurobia circularis capensis*) were described from this species by Lawrence.

Habits. These extremely active lizards dart up vertical rock surfaces with the greatest ease (FitzSimons) to seek shelter beneath flat stones or in crevices from which they are difficult to dislodge on account of the use they make of their strong claws (Smith).

Habitat. In Great Namaqualand found always on rocky precipices (Smith), but in Little Namaqualand they appear to be confined to the rock and boulder-strewn river beds where great numbers may be seen in favoured localities (FitzSimons).

Localities. **Cape Province:** Aughrabies Falls, Orange River; Garies to Kamiesberg; Goodhouse; Kamieskroon; Kuboos; Lekkersing; Victoria West (Selater, 1898, and Hewitt (1909a) but as *guttatus*). **South West Africa:** Churutabis; Great Namaqualand.

Range. Cape Province (Victoria West and Little Namaqualand) to South West Africa.

Genus CHAMAESAURA

1801. *Chamaesaura*¹ Schneider (part), Hist. Amphib., 2, pp. 205, 210 (type restricted to *anguina* Linné).
1820. *Monodactylus* Merrem, Versuch Syst. Amphib., p. 76 (type *anguina* Linné).
1826. *Chamaesaura* Fitzinger, Neue Class. Rept., pp. 18, 59 (type *anguina* Linné).
1832. *Cricochalcis* Wiegmann, Handbuch der Zool., p. 185 (no type designated but *aena* described though not named).
1862. *Mancus* Cope, Proc. Acad. Nat. Sci. Philadelphia, p. 339 (type *macrolepis* Cope).

For further synonymy see Boulenger, 1885e, Cat. Lizards Brit. Mus., 2, p. 263.

Head elongate; body serpentiform; limbs short, rudimentary, or fore limbs absent; tail extremely long. Head shields regular, strongly striated; nostril pierced in the postero-inferior corner of the nasal; eyelids well developed, the lower scaly; ear-opening moderate; 4 parietals; no collar fold; dorsals larger than ventrals, otherwise both uniform, lanceolate, strongly keeled, strongly imbricate, forming longitudinal and transverse series; femoral pores present in both sexes though sometimes scarcely distinguishable in females; tail without spines.

The five known forms, all of which I have examined, have the following characteristics in common, consequently these have been omitted from the specific descriptions.

Rostral 3-4² times as broad as high; a large subocular bordering the lip with 3 (rarely 2 or 4) labials anterior to it; 3 supraoculars, the anterior longest, the second broadest; 3 supraciliaries, the anterior longest; frontal hexagonal or heptagonal; a pair of postfrontals which are subequal to the 4 parietals; temporals covered by imbricate, keeled scales; 4 (rarely 3 or 5) lower labials, bordered by a row of 4 (rarely 5 in *anguina*) chin shields.

Range. South, East, and Central Africa to northern Uganda, i.e. to 4° N.

¹ Sherborn, 1925, Index Animalium, p. 1209, is wrong in citing *Chamaesaurus*, and Fitz-Simons, 1943, p. 409, in giving the date as 1799.

² Five for *aena* according to Boulenger (1885e, p. 263), seems improbable and does not agree with M.C.Z. material.

Remarks. An extraordinary homogeneous group except for the stages in limb reduction from the four-limbed, pentadactyle *aenea* to the two-limbed, monodactyle *macrolepis*, for which Cope proposed his genus *Mancus* solely on the absence of fore limbs.

Key to the Species

1. Midbody scale-rows 28; dorsals in 46 transverse rows from parietals to above anus; prefrontals forming a suture; fore and hind limbs pentadactyle; range: Cape Province north to Orange Free State and Transvaal. *aenea*
(p. 101)

Midbody scale-rows 26 or less; dorsals in 38-40 transverse rows from parietals to above anus; prefrontals separated by frontonasal forming a suture with frontal; fore and hind limbs, if present, monodactyle or didactyle. 2
2. Fore limbs, though rudimentary and scale-like, divided or undivided. 3

Fore limbs minute or absent. 4
3. Fore limb longer, its length being contained from 1 to $1\frac{1}{4}$ times in the distance from end of snout to anterior corner of orbit; range: eastern Cape Province, Natal and Zululand. *a. anguina*
(p. 102)

Fore limb shorter, its length being contained from $1\frac{1}{2}$ to $1\frac{3}{4}$ times in the distance from end of snout to anterior corner of orbit; range: eastern Belgian Congo and western Tanganyika north to Kenya and Uganda *a. tenuior*
(p. 105)
4. Midbody scale-rows 24-26; fore limb minute; range: Angola east to Nyasaland and southern Tanganyika. *miopropus*
(p. 107)

Midbody scale-rows 22; fore limb absent; range: Natal and Zululand north to the Transvaal. *macrolepis*
(p. 108)

Species or race	Rostral breadth into height	Supraoculars	Supraciliaries	Upper labials anterior to subocular	Lower labials	Large chin shields	Midbody scale-rows	Transverse dorsal rows from parietal to point above anus	Digits on fore limb	Digits on hind limb	Femoral pores
<i>aenea</i>	3 ¹	3-3	3-3	3-4	3-4	4	28	46	5	5	3
<i>a. anguina</i>	3-4	"	"	3	4-5	4-5	26	38-40	1-2	1-2	2-3
<i>a. tenuior</i>	3-4	"	"	2-3	4	4	24-26	38-40	1	1-2	1-2
<i>miopropus</i>	3-4	"	"	3	—	4	24-26	38-40	1	1	1-2
<i>macrolepis</i>	3-3.5	"	"	3	4	4	22	38-40	0	1	1

¹ Five for *aenea* according to Boulenger (1885e, p. 263), seems improbable.

CHAMAESAURA AENEA (Fitzinger)

1843. *Cricochalcis aenea* (Wiegmann) Fitzinger, Syst. Rept., p. 21: Africa
 1880. *Chamaesaura miodactyla* Günther, Ann. Mag. Nat. Hist. (5), 6, p. 235,
 fig: "Peri" i.e. Pirie Bush, Cape Province.
 1885e. *Chamaesaura aenea* Boulenger, p. 263.
 1898. Slater, p. 104.
 1898. Werner (1896-7), p. 140.
 1901. Gadow, p. 537.
 1907b. Roux, p. 422.
 1908b. Boulenger, p. 224.
 1909a. Hewitt, pp. 34, 37.
 1910b. Boulenger, p. 470.
 1910a. Hewitt, pp. 56, 71.
 1911b. Hewitt, p. 47.
 1913a. Werner, p. 109.
 1922. Duerden & Essex, p. 269, fig. 1.
 1923. Duerden, p. 362.
 1928a. Essex (1927), p. 883, figs. 1, 4, 7-14.
 1935. Lawrence, p. 44.
 1937e. Hewitt, p. 32, pl. x, fig. 3.
 1938. Gorham & Ivy, p. 179.
 1898. *Chamaesaura macrolepis* Werner (1896-7) (not Cope), p. 141.

Name. Transvaal Snake-lizard (English: Hewitt).

Description. Rostral in contact with, or separated from, the fronto-nasal; two superposed loreals (= a loreal over a postnasal); a pre-ocular; prefrontals forming a suture; anterior pair of parietals separated by an interparietal, posterior pair by an occipital; fore and hind limbs well-developed, pentadactyle, clawed.

For characters common to all species, see definition on p. 98, for scale and pore counts, see statistical table on p. 101.

Color. Above, head and back dark brown with three (vertebral and dorsolateral) light yellow or gray, black-edged, longitudinal lines; flanks straw color with two or three longitudinal series of dark spots or a reddish brown lateral band. Below, whitish or greenish white.

Size. Total length of ♂ (M.C.Z. 14204), 397 (95 + 302) mm., from Belfast; of the type of *miodactyla* (Brit. Mus.), 320+ (90 + 230+) mm., the tail being regenerated.

Thus the tail may comprise nearly three-quarters of the total length. Two 460 mm. adults had fore limbs of 11 mm. long, hind limbs of 14 and 16 mm. respectively (Essex).

Remarks. Boulenger (1885e) places the nostril in the antero-inferior

portion of the nasal, this is rejected for postero-inferior, for it does not differ in this respect from other members of the genus a position which some might prefer to describe as in the lower centre.

Schmidt (1919) sees no reason for Werner (1898) having referred three Natal lizards to *macrolepis*, two at least had four limbs and on one they were pentadactyle, apparently three species are involved!

Anatomy. Duerden & Essex (1922) discuss the skeletal structure of the limbs; Gorham and Ivy (1938) deal with the gall bladder.

Habitat. Grass veld uplands.

Localities. **Transvaal:** Belfast (M.C.Z.); Lydenburg District; Middleburg District; Modderfontein; Pretoria District; Standerton District; Zoutpansberg District. **Natal. Orange Free State. Cape Province:** near Cathcart, Amatola Mountains; Drakensberg; Fenella Falls, Tarkastad District; Oakville Farm, Elliot District; Pirie (Peri) Bush.

Range. Transvaal south through Orange Free State to eastern Cape Province and Natal.

CHAMAESAURA ANGUINA ANGUINA (Linné)

Plate 12, figs. 1b, 2-3

1735. *Vermis serpentiformis* Seba, Rerum naturalium Thesauri, **2**, p. 70, pl. lxxviii, figs. 7-8: Cape of Good Hope.
1758. *Lacerta anguina* Linné, Syst. Nat., ed. 10, **1**, p. 210: Cape of Good Hope, i.e. Union of South Africa.
1760. Linné, ed. 12, **1**, p. 371.
1768. *Chalcides pinnata* Laurenti, Syn. Rept., p. 64: Cape of Good Hope.
1795. *Chalcida anguina* Meyer, p. 31.
1801. *Chamaesaura Anguinea* (sic) Schneider, p. 210.
- 1802d. *Seps monodactylus* Daudin, Hist. Nat. Rept., **4**, p. 342, pl. lvii, fig. 1: Cape of Good Hope.
1811. *Chalcides monodactylus* Oppel, p. 45.
1820. *Monodactylus anguinus* Merrem, p. 76: Africa.
1838. *Chamaesaura anguina* Gray, p. 392.
1839. Duméril & Bibron, p. 441.
1845. Gray, p. 61.
1849. Smith, A., App., p. 10.
1851. Gravenhorst, p. 309, pl. xxx.
- 1867a. Steindachner, p. 42.
- 1885e. Boulenger, p. 264.
1889. Boettger, p. 292.
- 1890a. Müller, p. 286.
- 1893a. Boettger, p. 66.

1898. Slater, p. 104.
 1898. Werner (1896-7), p. 140.
 1905h. Boulenger, p. 253.
 1907b. Roux, p. 423.
 1908b. Boulenger, p. 224.
 1909a. Hewitt, pp. 34, 37.
 1910b. Boulenger, p. 470.
 1911b. Hewitt, p. 47.
 1913a. Werner, p. 109, fig.
 1922. Duerden & Essex, p. 270, figs. 2-3.
 1923. Duerden, p. 362.
 1925. Essex, p. 339.
 1926b. Rose, p. 493.
 1927b. Hewitt, p. 454.
 1928a. Essex (1927), pp. 884, 932, figs. 2, 5, 15, 16, 17.
 1929. Rose, pp. 113, 125, fig. 82.
 ?1933m. Witte, p. 72 (Elisabethville, B. C., so removed to *C. a. tenuior*).
 1935. Lawrence, p. 44.
 1937e. Hewitt, p. 32, pl. x, figs. 2, 6.
 1890d. *Chamaesaura didactyla* Boulenger Proc. Zool. Soc. London, pp. 78, 82, pl. xi, fig. 1: South Africa.
 1898. Slater, p. 104.
 1898. *Chamaesaura macrolepis* Werner (1896-7) (not Cope), p. 141.

For an extensive bibliography for the century prior to 1839, see Duméril & Bibron, 1839, Erpét. Gén., 5, p. 441.

Native names. Cape Snake-lizard (English: Hewitt); *sweepslang* or *pootjie slang* (Afrikaans, but latter not even generic: Hewitt); *un-ombatamb'ezantsi* (Kaffir: Hewitt).

Description. Rostral in contact with, or separated from, the fronto-nasal; a postnasal; a single or two superposed loreals; a preocular; prefrontals separated by the frontonasal being in contact with the frontal; anterior, and sometimes the posterior, pairs of parietals separated by a large interparietal, or the posterior by one or two small scales, or posterior pair in contact posteriorly; fore and hind limbs styliform, undivided, or hind limbs divided, terminating in minute claws, or clawless.

For characters common to all species, see definition on p. 98, for scale and pore counts, see statistical table on p. 101.

Color. Above, head and back dark brown, uniform or latter laterally edged with black forming a pair of dark longitudinal lines; a light vertebral line; flanks straw color with or without a narrow, longitudinal, white lateral band. Below, whitish or golden yellow.

Size. Total length of type of *didactyla* (Brit. Mus.), 530 (110 + 420) mm., of a ♀ (M.C.Z. 21430), 467 (115 + 352) mm.

Remarks. As Hewitt (1909a) and so many authors have pointed out, the variability of this species in respect to its limbs being monodactyle or didactyle is unquestionable. Roux (1907b) comments on one lizard with a didactyle and two-clawed right fore limb whose other three feet were monodactyle, another had clawed fore limbs but clawless hind limbs. Whether clawlessness in members of this genus implies that the claws have not been developed or have been lost, is a matter which requires investigation.

Anatomy. Duerden & Essex (1922) and Essex (1928) remark that the fore and hind limbs average 6 and 8 mm. respectively and usually terminate in a single claw, and discuss limb reduction generally.

Breeding. In February, 4 or 5 young are born when about six inches in length (Rose).

Habits. Even in its slowest movements this active lizard makes no use of its limbs so far as can be seen, the forepart of the body being raised clear of the ground. Its passage through grass is too swift and smooth for the eye to follow (Rose). So snake-like were the motions of one which was encountered gliding over a rock in rocky country, that it was mistaken for a *Psammophis crucifer* (Essex).

Habitat. Occurs chiefly among grass or stones near streams or the sea coast in humid localities (A. Smith).

Localities. **Zululand:** Umfolosi Station (*vide* Boulenger, 1905h). **Natal:** Durban (*vide* Boulenger, 1910b). **Cape Province**¹: Bains Kloof; Bathurst; Caledon Division; Cape Peninsula; Cape Town; Coldspring; Grahamstown; Kaffraria; Kei Road; Kentani; Knysna; Maclear; Mquanduli; Muizenberg; New Brentingville; Ngqeleni; Pondoland; Port Alfred; Port Elizabeth; Range Cottage, Table Mountain; Schoonster's Drift; Swellendam; Tokai; West Hill near Grahamstown; Worcester. (Witte's (1933m) record from Elisabethville, Belgian Congo is tentatively transferred to the northern race *tenuior*. As *C. macrolepis* is the common species of Natal and Zululand it might be advisable to check the identifications of 1905 and 1910 listed above).

Range. Transvaal, Swaziland, and Zululand south to Natal west across Cape Province to Little Namaqualand.

¹ The Irene record of Hewitt was later corrected by him (1911b) to Tokai; that of Little Namaqualand (Boulenger, 1910b) is obviously wrong locality data, for FitzSimons (*in litt.*) informs me that no *Chamaesaura* occurs there.

CHAMAESAURA ANGUINA TENUIOR Günther

1895. *Chamaesaura tenuior* Günther, Ann. Mag. Nat. Hist. (6), 15, p. 524, pl. xxi, fig. 6: Kampala, Uganda.
1896. Tornier, p. 37.
1897. Tornier, p. 64.
- 1898c. Boulenger, p. 915.
- 1902d. Boulenger, p. 445 (as *tacnnior*).
- 1902b. Tornier, p. 582.
1909. Peracca, p. 166 (as *taenuior*).
- 1912c. Sternfeld, p. 209.
- 1913c. Nieden, p. 74.
- 1923a. Loveridge, p. 18.
- 1923d. Loveridge, p. 850.
- 1924b. Loveridge, p. 10.
- 1929h. Loveridge, p. 59.
- 1930b. Barbour & Loveridge, p. 788.
- 1936j. Loveridge, p. 297.
1939. Someren, p. 157, pl. A, fig. 2.
- 1942e. Loveridge, p. 330.
- 1899c. *Chamaesaura annectens* Boulenger, Proc. Zool. Soc. London, p. 97: Ravine Station, Mau Mountains, 7500 ft., Kenya Colony.
- 1900b. Tornier, p. 590.
- 1902d. Boulenger, p. 445.
- 1908c. Boulenger, p. 5.
1909. Peracca, p. 166.
- 1911c. Boulenger, p. 162.
- 1913c. Nieden, p. 74.
- 1923d. Loveridge, p. 850 (as *annectans*).
- 1924b. Loveridge, p. 10 (as *annectans*).
- ?1933m. *Chamaesaura anguina* Witte (not Linné), p. 72.

Native names. *Mugoye* (Ragoli); *shikoye* (Tereki), *nyarunyansi* (Toro and Wamba).

Description. Rostral in contact with¹, or separated from, the fronto-nasal; a postnasal; a loreal; a preocular; prefrontals separated by the frontonasal being in contact with the frontal; anterior and posterior pairs of parietals separated by a large interparietal, or the posterior by one or two small scales; fore and hind limbs styli-form, undivided, or hind limbs divided, terminating in minute claws, or clawless.

For characters common to all species, see definition on p. 98, for scale and pore counts, see statistical table on p. 101.

¹Tornier (1896) states that this condition obtains in a ♀ from Kavirondo, but that while two of her offspring agree in this respect, in the other embryos the rostral is separated from the frontonasal.

Color. Above, head and back pale or dark brown, latter laterally edged with black forming a pair of dark longitudinal lines; a light vertebral line present or absent; flanks straw color with or without a narrow, longitudinal, white lateral band. Below, whitish or pinkish white.

Size. Total length of type of *tenuior* (Brit. Mus.), 570 (114 + 456) mm., of type of *annectens* (Brit. Mus.), 450+ (150 + 300+) mm., tail reproduced, of a ♀ (M.C.Z. 41101), 637 (135 + 502) mm.

It is interesting to note that in very young embryos the tail is little more than twice the length of head and body, while in adults it is as much as 3.7 times.

Remarks. Günther stated that the fore limb was about equal to the orbit in length, and that the hind limb was not quite twice as long, actually the former's length is contained from once and a half to once and three quarters in the distance from end of snout to anterior corner of orbit, thus differing from typical *anguina* of Southeast Africa where the hind limb about equals or is contained once and a quarter times in the distance from end of snout to anterior corner of orbit. In coloration and other respects there seems little to differentiate the two so I prefer to regard *tenuior* as a northern race.

My reasons for uniting *annectens* with *tenuior* were given (1929h) in detail. In a Kaimosi series both monodactyle and didactyle lizards occurred, some having 24, others 26, midbody scale rows. Nor can Kaimosi be regarded as the meeting place of two forms for apparently the same variation occurs throughout its range.

Breeding. On February 12, at Kaimosi, five females were gravid, two examined held 9 and 10 embryos respectively, one of the latter measured 117 (35 + 82) mm., another lizard held only 6 embryos, one measuring 77 (25 + 52) mm. In June or July, in mountains northwest of Lake Tanganyika, Sternfeld records embryos, the viviparous nature of this race being first recorded by Tornier (1896). On December 12, at Fort Portal, a 138 mm. ♀ held embryos (Loveridge).

Diet. Observed capturing flies and moths, a captive lizard took nymphal grasshoppers (van Someren).

Enemies. Recovered from stomach of Bare-faced Hawk (*Gymnogyps t. typicus*) by van Someren.

Habits. These serpentiform lizards delight to bask on tufts of dry grass into which they dive, or from which they slide to the ground, on being disturbed. If approached quietly, however, it was possible to sweep them up in a butterfly net. Wakamba, who showed no fear of skinks such as *Mabuya striata*, hesitated to catch *tenuior* on account of their serpentiform appearance (van Someren).

Habitat. Grasslands from 3000 to 8000 feet.

Localities. **Uganda:** Fort Portal; Kabulamuliro; Kacheliba; Kampala; Kasiba; Kitende, west of Mbarara; Mabira Forest; Mitiana; Sesse Islands. **Kenya Colony:** Chuyulu Hills; Gilgil (M.C.Z.); Kaimosi; Kossowo; Kwa Raschuongo in Kavirondo; Loita Plains; Mount Kenya; Ravine Station; Ugowe Bay, Kavirondo Gulf; Yala River. **Tanganyika Territory:** Kakutta (1902b) later spelled Kalkutta (1913c) is probably a locality in the western Usambara Mountains where Eggel collected. **Belgian Congo:** ? Elizabethville; Mountains northwest of Lake Tanganyika.

Range. Kenya Colony and northeastern Tanganyika Territory west to Uganda and eastern Belgian Congo.

CHAMAESAURA MIOPROPUS Boulenger

- 1894e. *Chamaesaura miopropus* Boulenger, Proc. Zool. Soc. London, pp. 724
732: "Fwambo" i.e. Fuambo, Nyasaland.
- 1900b. Tornier, p. 590.
1911. Sternfeld & Nieden, p. 385.
- 1913c. Nieden, p. 74.
- 1923a. Loveridge, p. 18.
- 1923d. Loveridge, p. 850.
- 1924b. Loveridge, p. 10.
- 1933h. Loveridge, p. 302.
1933. Schmidt, p. 10.
- 1937f. Loveridge, p. 498.
- 1895a. *Chamaesaura macrolepis* Bocage (not Cope), p. 25.
- 1937b. Monard, p. 61.

Native names. *Nyoka lusagalla* (Hehe); *nunduswa* (Kinga); *nombo* (at Galanga: Bocage).

Description. Rostral separated from the frontonasal; a postnasal; an elevated loreal; a preocular; prefrontals separated by the frontonasal being in contact with the frontal; anterior and posterior pairs of parietals separated by a large interparietal; fore limbs a minute clawed vestige; hind limbs styliform, undivided, clawed.

For characters common to all species, see definition on p. 98, for scale and pore counts, see statistical table on p. 101.

Color. Above, head and back pale brown, uniform except for minute black flecks, or like *tenuior* with or without a narrow, longitudinal, white lateral band. Below, whitish or pinkish white.

Size. Total length of type (Brit. Mus.), 550 (120 + 430) mm., of a ♂ (M.C.Z. 30765), 443 (87 + 356) mm., of a ♀ (M.C.Z. 30764), 455 (103 + 349) mm.

Remarks. Schmidt (1933) has suggested the probability that the two Angolan lizards identified as *macrolepis* by Bocage are more probably *miopropus*. Bocage's remarks about the minute fore limbs makes this practically certain. One wonders whether the Elisabethville reptile referred to *anguina* by Witte (1933m), which I have tentatively placed under *a. tenuior*, might not possibly be a *miopropus* also. The high labial count given by me (1933h) for some Tanganyika *miopropus* was due to the inclusion of the subocular and small scales over the gape.

Breeding. On February 8, at Ipemi, a ♀ held several small ova; on April 30, at Igale, another held a single round egg measuring 7 mm. in diameter.

Diet. Black field crickets, grasshoppers, caterpillars and apparently a beetle larva.

Habits. Fond of sunning itself on tussocks of dry grass into which it vanishes with great speed when disturbed.

Habitat. In long dry grass at high altitudes.

Localities. **Tanganyika Territory:** Livingstone Mountains; near Manitete, Unyika; Poroto Mountains — Igale Pass; Ukinga Mountains — Ihenye and Tandala; Uzungwe Mountains — Dabaga and Ipemi. **Nyasaland:** Fuambo (Fwambo). **Angola:** Caconda; Chitau; Galanga (see *Remarks*).

Range. Southern Tanganyika Territory and Nyasaland. Angola.

CHAMAESAURA MACROLEPIS (Cope)

1862. *Mancus macrolepis* Cope, Proc. Acad. Nat. Sci. Philadelphia, p. 339: Natal.
- 1885e. *Chamaesaura macrolepis* Boulenger, p. 264.
1898. Slater, p. 104.
1898. Werner (1896-7; part), p. 141.
- 1908b. Boulenger, p. 224.
1908. Odhner, p. 3.
- 1909a. Hewitt, pp. 34, 37.
- 1910b. Boulenger, p. 470.
- 1910a. Hewitt, p. 60.
- 1911b. Hewitt, p. 48.
- 1913a. Werner, p. 109.
1919. Schmidt, p. 607.
1922. Duerden & Essex, p. 273, fig. 4.
1923. Duerden, p. 362.
- 1927b. Hewitt, p. 454.
- 1928a. Essex (1927), p. 884, figs. 3, 6, 18, 19.
1935. *Chamaesaura macropholis* (*sic*) Lawrence, p. 44 (*lapsus*).

Further citations of *macrolepis* will be found under *aenea*, *a. anguina*, and *miopropus*.

Description. Rostral separated from the frontonasal, which may be transversely divided; a postnasal; an elevated loreal¹; a preocular; prefrontals separated by the frontonasal being in contact with the frontal; anterior, and usually the posterior, pair of parietals separated by a large interparietal; fore limbs absent, hind limbs styliform, undivided, terminating in a minute claw, or clawless.

For characters common to all species, see definition on p. 98, for scale and pore counts, see statistical table on p. 101.

Color. Above, head and back pale brown, a pair of dark, longitudinal dorsal lines; flanks straw color with two longitudinal series of dark dots. Below, whitish.

Size. Total length of ♂ (M.C.Z. 16162), 519 (124 + 395) mm. from Zululand, of unsexed type (A.N.S.P. 9709), 638 (138 + 500) mm. (*vide* Schmidt).

Remarks. Schmidt (1919) describes in detail Philadelphia Academy No. 9709 as type, designating No. 9708 as paratype. Former A.N.S.P. 9713 (now M.C.Z. 17736) is labeled cotype, actually, however, Cope writes in the singular of "this lizard."

Anatomy. Duerden and Essex (1922) discuss the skeletal structure of the limbs, also limb reduction has been studied by Essex who figures different degrees of it in the bones of the hind limb of this species.

Diet. Small orthoptera and spider (in M.C.Z. specimen).

*Localities.*² **Transvaal:** White River, Lydenburg District. **Zululand:** Dukuduku (Indukuduku); Mseleni; Somkele (Mich. Mus.). **Natal:** Durban; Lower Tugela River; Pietermaritzburg.

*Range.*² Southeastern Transvaal, Swaziland, and Zululand south to Natal.

¹ Schmidt writes of two loreals, merely a difference in designation, the anterior being here regarded as a postnasal.

² Bocage (1895a) records from Angola are referred to *miopropus*.

BIBLIOGRAPHY

of 180 works mentioning African CORDYLIDAE from 1735-1942, but no attempt has been made to complete those prior to 1880.

Titles of papers are omitted for sake of brevity.

ANDERSSON, L. G.

1900. Bihang K. Svenska Vet.-Akad. Handl., **26**, No. 1, pp. 1-29.

1916. Göteborgs Kungl. Vetensk. Vitterh. Handl. (4), **17**, No. 5
(= Meddel. Göteb. Musei Zool. Afdel., No. 9), pp. 1-41.

BARBOUR, T. & LOVERIDGE, A.

1929. Bull. Mus. Comp. Zoöl., **79**, pp. 205-360 (not cited as only listing type material).

1930b. in Strong, R., "Report of the Harvard African Expedition upon the African Republic of Liberia and the Belgian Congo." (Cambridge, Mass.), **2**, pp. 786-796.

BATEMAN, G. C.

1897. "The Vivarium." (London), pp. 1-424, figs. 1-98, pl. —.

BOCAGE, J. V. B. DU

1895a. "Herpétologie d'Angola et du Congo." (Lisboa), pp. i-xx + 1-203, pls. i-xix.

1896a. Journ. Sci. Lisboa (2), **4**, No. 14, pp. 65-104, pls. i-ii.

1896c. Journ. Sci. Lisboa (2), **4**, No. 14, pp. 115-120.

BOETTGER, O.

1881c. Abhand. Senckenberg. Naturf. Ges., **12**, pp. 435-558, pls. i-v.

1887b. Ber. Senckenberg. Naturf. Ges., pp. 135-173, pl. v.

1889. Ber. Senckenberg. Naturf. Ges., pp. 267-316.

1893a. "Katalog der Reptilien-Sammlung in Museum der Senckenbergischen naturforschenden Gesellschaft in Frankfurt-am-Main." (Frankfurt a. M.), pp. i-ix + 1-140.

1894a. Ber. Senckenberg. Naturf. Ges., pp. 88-93.

1913. in Voeltzkow, A., 1908-1917, "Reise in Ostafrika." (Stuttgart), **3**, pp. 269-376, pls. xxiii-xxx.

BOIE, F.

1828. Nova Acta Acad. Caes. Leop.-Carol., **14**, pp. 139-142.

BOULENGER, E. G.

1929. "Reptiles and Batrachians." (London), pp. i-xiv + 1-278, 78 pls.

BOULENGER, G. A.

1884a. Ann. Mag. Nat. Hist. (5), **14**, pp. 117-122.

1885e. "Catalogue of the Lizards in the British Museum (Natural History)," ed. 2 (London), **2**, pp. i-xiii + 1-497, pls. i-xxiv.

- 1890d. Proc. Zool. Soc. London, pp. 77-87, pls. viii-xi.
 1891d. Ann. Mag. Nat. Hist. (6), 7, p. 417.
 1892a. in Distant, W. L. "A Naturalist in the Transvaal." (London), pp. 174-176, fig.
 1894e. Proc. Zool. Soc. London, pp. 722-736, pls. xlvii-xlix.
 1896b. Ann. Mus. Civ. Stor. Nat. Genova (2), 17, pp. 5-14.
 1897b. Ann. Mag. Nat. Hist. (6), 19, pp. 276-281, figs. -.
 1897e. Proc. Zool. Soc. London, pp. 800-803, pl. xlvi.
 1897g. Ann. Mus. Civ. Stor. Nat. Genova (2), 17, pp. 275-280.
 1898c. Proc. Zool. Soc. London, pp. 912-923, pls. lv-lvii.
 1899c. Proc. Zool. Soc. London, pp. 96-98, pl. x.
 1902b. Proc. Zool. Soc. London, pp. 13-18, pls. ii-iv.
 1902d. in Johnston, H., "The Uganda Protectorate." (London), 1, pp. 445-447.
 1903e. Ann. Mag. Nat. Hist. (7), 12, pp. 215-217, pls. xvi-xvii.
 1905h. Proc. Zool. Soc. London, pp. 248-255.
 1907j. Proc. Zool. Soc. London, pp. 478-487, figs. 140-141, pls. xxi-xxii.
 1908b. Ann. Natal Govt. Mus., 1, pp. 219-235, figs. 1-3, pls. xxv-xxvi.
 1908c. Ann. Mus. Civ. Stor. Nat. Genova (3), 4, pp. 5-7, fig. -.
 1910b. Ann. S. African Mus., 5, pp. 455-538.
 1911c. Ann. Mus. Civ. Stor. Nat. Genova (3), 5, pp. 161-169.

BROOM, R.

1913. Proc. Zool. Soc. London, p. 548, pl. lxxiv.
 1935. Ann. Transvaal Mus., 18, pp. 13-31, figs. 1-3.

CAMP, C. L.

1923. Bull. Am. Mus. Nat. Hist., 48, pp. 289-481, figs. A-L + 1-112.

CHUBB, E. C.

- 1909a. Proc. Zool. Soc. London, pp. 590-597.
 1909b. Rhodesia Mus. Bulawayo, 8th. Ann. Rep., pp. 34-36.

COPE, E. D.

1862. Proc. Acad. Nat. Sci. Philadelphia, pp. 337-344.
 1869. Proc. Amer. Philos. Soc., 11, pp. 147-169.

COTT, H. B.

1928. Proc. Zool. Soc. London, pp. 923-961, pls. i-iv.
 1934a. Proc. Zool. Soc. London, pp. 145-173, figs. 1-3, pls. i-iii.

CUVIER, G. L. C. F. D.

1829. "Le Règne Animal distribué d'après son organisation pour servir de base à l'Histoire naturelle des Animaux et d'introduction à l'Anatomie Comparée. 2, Les Reptiles." (Paris), ed. 2, pp. i-xvi + 1-406.

DAM, see VAN DAM

DAUDIN, F. M.

- 1802d. "Histoire naturelle, générale et particulière, des Reptiles." 4, pp. 1-397, pls. xlvi-lviii.

DITMARS, R. L.

1910. "Reptiles of the World." (London), pp. i-xi + 1-373, pls. i-lxxxix.

DUERDEN, J. E.

1923. S. African Journ. Sci., 20, pp. 257-265 (largely a synopsis of 1922 paper; see below).

DUERDEN, J. E. & ESSEX, R.

1922. S. African Journ. Sci., 19, pp. 269-275.

DUMÉRIL, A. M. C. & BIBRON, G.

1839. "Erpétologie Générale ou Histoire Naturelle complete des Reptiles." (Paris), i-viii + 1-855, pls. 1-lviii.

ESSEX, R.

1925. Rec. Albany Mus., 3, pp. 332-342, figs. 1-8.

- 1928a. Proc. Zool. Soc. London, 1927, pp. 879-945, figs. 1-86, pls. i-viii.

FISCHER, J. G.

- 1888b. Jahrb. Hamburg. Wiss. Anst., 5, pp. 11-17, pl. ii.

FITZINGER, L. J. F. J.

1826. "Neue Classification der Reptilien . . . Zoologischen Museum's zu Wien." (Wien), pp. i-viii + 1-66, pl. i.

1843. "Systema Reptilium . . . Fasculus primus: Amblyglossae (Conspetus geographicus)." (Vindobonae), pp. 1-106.

FITZSIMONS, F. W.

1932. "Snakes." (London), pp. i-xiv + 1-286, pls.

FITZSIMONS, V.

1930. Ann. Transvaal Mus., 14, pp. 20-48, figs. 1-29, pl.

1933. Ann. Transvaal Mus., 15, pp. 273-280, figs. 1-6, pl.

- 1935a. Ann. Transvaal Mus., 15, pp. 519-550.

- 1935b. Ann. Transvaal Mus., 16, pp. 295-397, figs. 1-30, pls. x-xi.

- 1937a. Ann. Transvaal Mus., 17, pp. 259-274, pl. x.

1938. Ann. Transvaal Mus., 19, pp. 153-209, map, pls. ii-iv.

- 1939a. Ann. Transvaal Mus., 20, pp. 5-16, figs. 1-17.

- 1939b. Ann. Transvaal Mus., 20, pp. 17-46.

1941. Ann. Transvaal Mus., 20, pp. 273-281, figs. 1-8, pl. xii.

1943. Transvaal Mus. Mem. 1. "The Lizards of South Africa" (Pretoria), pp. i-xv + 1-528, figs. 1-384, pls. i-xxiv, map. (received too late for general citation in this revision).

FLOWER, S. S.

- 1925b. Proc. Zool. Soc. London, pp. 911-981.

GADOW, H.

1901. in Cambridge Natural History, "Amphibia and Reptiles." (London), **8**, pp. i-xiii + 1-668, figs. 1-181, map. (reprinted 1920).

GILCHRIST, J. D. F.

1911. "South African Zoology." (Cape Town). *Non vidi*.

GORHAM, F. W. & IVY, A. C.

1938. Field Mus. Nat. Hist. Zool. Series, **22**, pp. 159-213.

GRAVENHORST, J. L. C.

1851. Nova Acta Acad. Caes. Leop.-Carol., **23**, **1**, pp. 291-394, pls. xxvii-xlv.

GRAY, J. E.

- 1831b. "Synopsis of the Species of the Class Reptilia." pp. 1-110, in Griffith, E. "The Animal Kingdom arranged in conformity with its organization by the Baron Cuvier." (London), **9**, pp. 1-481 + 1-110, pls. i-xlii.
1838. Ann. Nat. Hist., **1**, pp. 274-283 + 388-394.
1845. "Catalogue of the Specimens of Lizards in the Collection of the British Museum." (London), pp. i-xxviii + 1-289.

GRONOVIVS, L. T.

1763. "Zoophylacium Grovianum exhibiens Animalia Quadrupeda, Amphibia, . . ." etc. (Lugduni Batavorum), pp. i-vi + 1-380, pls. i-xxi.

GUÉRIN, MENEVILLE (F. E. GUÉRIN-MENEVILLE)

- 1829- "Iconographie du Regne Animal de G. Cuvier, ou representation d'apres Nature de l'une des especes les plus remarquables, et souvent non encore figurés de chaque genre d'animaux. Avec un text descriptif, etc." (Paris), **1**, pls. i-xxx; **3**, pp. i-xvi + 1-576.

GÜNTHER, A.

1880. Ann. Mag. Nat. Hist. (5), **6**, pp. 234-238, figs. -
1895. Ann. Mag. Nat. Hist. (6), **15**, pp. 523-529, pl. xxi.

HEWITT, J.

- 1909a. Ann. Transvaal Mus., **2**, pp. 29-40, pl. -.
- 1910a. Ann. Transvaal Mus., **2**, pp. 50-71.
- 1911b. Ann. Transvaal Mus., **3**, pp. 42-55.
- 1914a. S. African Journ. Sci., **10**, pp. 238-253, maps.
1920. Trans. Roy. Soc. S. Africa, **7**, pp. 91-93, figs. -.
- 1925b. Rec. Albany Mus., **3**, pp. 343-368, figs. 1-4 + 3, pls. xv-xix.
- 1927a. Rec. Albany Mus., **3**, pp. 371-415, figs. 1-2, pls. xx-xxiv.
- 1927b. S. African Journ. Sci., **24**, pp. 452-456.
1932. Ann. Natal Mus., **7**, pp. 105-128, fig. -, pl. vi.
- 1933a. Occ. Papers Rhodesian Mus., **2**, pp. 45-50, pl. ix.

- 1937d. *Ann. Natal Mus.*, **8**, pp. 199-209, pl. xii.
- 1937e. "A Guide to the Vertebrate Fauna of the Eastern Cape Province, South Africa. Part II. Reptiles, Amphibians and Freshwater Fishes." (Grahamstown), pp. 1-118 (141), pls. i-xxviii (xxxiv). (Freshwater Fishes excluded as being by another author).
- HEWITT, J. & POWER, J. H.
1913. *Trans. Roy. Soc. S. Africa*, **3**, pp. 147-176.
- JEUDE, T. W. VAN L. DE
1895. *Notes Leyden Mus.*, **16**, pp. 227-230.
1898. *Mus. Hist. Nat. Pays-Bas*, **10**, part 2, pp. 1-54 + 1-52 + 1-11.
- LAURENTI, J. N.
1768. "Austriaci Viennensis Specimen Medicum, exhibiens Synopsis Reptilium Emendatam cum Experimentis circa Venena et Antidota Reptilium Austriacorum." (Vienna), pp. 1-216.
- LAWRENCE, R. F.
1935. *Parasitology* (Cambridge, Eng.), **27**, pp. 1-45, figs. 1-22.
1937. *Cape Naturalist* (Cape Town), **1**, pp. 107-113, figs. 1-4.
- LINNÉ, CARL VON
1758. "Systema Naturae." (Holmiae), ed. 10, **1**, pp. 1-824.
1760. "Systema Naturae." (Halaë Magdeburgicae), ed. 12, **1**, pp. 1-532.
- LOVERIDGE, A.
1920a. *Proc. Zool. Soc. London*, pp. 131-167.
1923a. *Journ. Tanganyika Civil Serv. Assoc.*, pp. 10-28.
1923d. *Proc. Zool. Soc. London*, pp. 841-863.
1923h. *Proc. Zool. Soc. London*, pp. 935-969.
1924b. *Journ. E. Africa & Uganda Nat. Hist. Soc.*, Spec. Suppl. No. 3, pp. 1-16.
1929h. *Bull. U. S. Nat. Mus.*, No. 151, pp. 1-135, pl. i.
1932a. *Bull. Mus. Comp. Zoöl.*, **72**, pp. 375-387.
1933h. *Bull. Mus. Comp. Zoöl.*, **74**, pp. 197-416, pls. i-iii.
1936h. *Field Mus. Nat. Hist., Zool. Series*, **22**, pp. 1-111.
1936j. *Bull. Mus. Comp. Zoöl.*, **79**, pp. 209-337, pls. i-ix.
1937f. *Bull. Mus. Comp. Zoöl.*, **79**, pp. 481-541, pls. i-iv.
1942e. *Bull. Mus. Comp. Zoöl.*, **91**, pp. 235-374, pls. i-vi.
- MANN, I.
1931. *Trans. Zool. Soc. London*, **21**, pp. 355-412, figs. 34-35, pls. xx-xxiv.
- MATSCHIE, P.
1891a. *Zool. Jahrb Syst.*, **5**, pp. 605-611.
- MERREM, B.
1820. "Versuch eines Systems der Amphibien. Tentamen systematis Amphibiorum (Marburg), pp. i-xv + 1-189, pl. i.

MERTENS, R.

1937b. *Abhand. Senckenberg. Naturf. Ges.*, No. 435, pp. 1-23.

1937d. *Veröfften. Deutschen Kolon.-Übersee-Mus. Bremen*, 2, pp. 1-9.

METHUEN, P. A. & HEWITT, J.

1913c. *Trans. Roy. Soc. S. Africa*, 3, pp. 107-111, pl. vii.

1914b. *Ann. Transvaal Mus.*, 4, pp. 118-145, figs. 14-16, pl. xiv.

MEYER, F. A. A.

1795. "Synopsis Reptilium, novam ipsorum sistens Generum Methodum nec non Gottingensium huius Ordinis Animalium Enumerationem." (Gottingae), pp. 1-32.

MOCQUARD, F.

1909. *Nouv. Arch. Mus. Paris* (5), 1, pp. 1-110.

MONARD, A.

1937b. *Arqu. Museu Bocage, Lisboa*, 8, pp. 1-154, figs. 1-3.

MÜLLER, F.

1890a. *Verh. Naturf. Ges. Basel*, 8, pp. 249-296, pls. i-iii.

1890b. *Verh. Naturf. Ges. Basel*, 8, pp. 685-705, pl. x.

NIEDEN, F.

1913c. *Mitt. Zool. Mus. Berlin*, 7, pp. 51-100.

NOBLE, G. K. & BRADLEY, H. T.

1933b. *Ann. New York Acad. Sci.*, 35, pp. 25-100.

ODHNER, T.

1908. *Arkiv. Zool.*, 4, No. 18, pp. 1-7.

OPPEL, M.

1811. "Die Ordnungen, Familien und Gattungen der Reptilien als Prodom einer Naturgeschichte derselben." (Munchen), pp. 1-87.

PARKER, H. W.

1936c. *Novit. Zool. (Tring)*, 40, pp. 115-146, figs. 1-2.

PEERS, B.

1930. *S. African Journ. Nat. Hist. (Pretoria)*, 6, pp. 402-411, photos.

PERRACA, M. G.

1909. in *Abruzzi, "Il Ruwenzori."* (Milano), 1, pp. 165-180.

PETERS, W. C. H.

1854. *Montasb. Akad. Wiss. Berlin*, pp. 614-628.

1855. *Arch. Naturg.*, 21, pp. 43-58.

1862a. *Monatsb. Akad. Wiss. Berlin*, pp. 15-26.

1862c. *Abh. Berlin Akad.*, pp. 165-225, pls. i-iii.

1869b. *Ofver. Kongl. Vetensk.-Akad. Förh.*, pp. 657-662.

1879a. *Sitz. Ges. Naturf. Freunde Berlin*, pp. 10-11.

- 1882a. "Naturwissenschaftliche Reise nach Mossambique . . . Zoologie, **3**, Amphibien." (Berlin), pp. i-xv + 1-191, pls. i-xxx.
- PFEFFER, G.
 1889. Jahrb. Hamburg. Wiss. Anst., **6**, pp. 1-36.
 1893. Jahrb. Hamburg. Wiss. Anst., **10**, pp. 71-105, pls. i-ii.
- PITMAN, C. R. S.
 1934. "Report on a Faunal Survey of Northern Rhodesia." (Livingstone), pp. i-xii + 1-500 + Index i-xxxii, maps A-K.
- POPP, B.
 1931. Aquarium (Berlin), pp. 191-194, photos.
 1939. Wochenschr. Aquar. Terra. (Braunschweig), **36**, pp. 263-264, photos.
- POWER, J. H.
 1918. S. African Journ. Sci., **14**, pp. 263-271.
 1927c. Trans. Roy. Soc. S. Africa, **14**, pp. 405-422, fig. 1, pls. xviii-xxii, map.
 1930. Ann. Transvaal Mus., **14**, pp. 11-19, fig. 1, pls. i-ii.
 1931. Trans. Roy. Soc. S. Africa, **20**, pp. 39-49, figs. 1-2.
 1933a. Trans. Roy. Soc. S. Africa, **21**, pp. 211-220, map.
- REICHENOW, A.
 1887. Zool. Anz., **10**, pp. 369-372.
- ROCHEBRUNE, A. T. DE
 1884a. "Faune de la Sénégalie. Reptiles." (Paris), pp. 1-221, pls. i-xx.
- ROSE, W.
 1926b. Ann. S. African Mus., **20**, pp. 491-494.
 1929. "Veld and Vlei." (Cape Town), pp. i-xxiii + 1-240, figs., photos 1-125.
- ROUX, J.
 1907b. Zool. Jahrb. Syst., **25**, pp. 403-444, pls. xiv-xv.
- SCHLEGEL, H.
 1834. Tijdschr. Nat. Gesch. Phys., **1**, pp. 203-221, pl. vii.
- SCHMIDT, K. P.
 1919. Bull. Amer. Mus. Nat. Hist., **39**, pp. 385-624, figs. 1-27, pls. vii-xxxii.
 1933. Ann. Carnegie Mus., **22**, pp. 1-15, figs. 1-2, pls. i-ii.
- SCHMIDT, P.
 1930. Aquarium (Berlin), pp. 153-155, photos.
- SCHNEIDER, J. G.
 1801. "Historiae Amphibiorum naturalis et literariae." (Jena), pp. 1-364, pls. i-ii.

SCLATER, W. L.

1898. *Ann. S. African Mus.*, **1**, pp. 95-108, pl. v.

SCORETTECCI, G.

1940c. *Atti. Soc. Ital. Sci. Nat. (Milano)*, **79**, pp. 1-10, figs. 1-2, pls. i-ii.

SEBA, A.

1735. "Locupletissimi Rerum Naturalium Thesauri Accurata Descriptio, et Iconibus Artificiosissimis Expressio, per Universam Physices Historiam," etc. (Amstelaedami), **2**, pp. i-xxx + 1-154, pls. i-exiv.

SENFFT, W.

1931. *Aquarium (Berlin)*, pp. 73-75, photos.

SMITH, A.

1838a. *Mag. Nat. Hist. (2)*, **2**, pp. 31-33.

1843. "Illustrations of the Zoology of South Africa . . . Reptiles."

1849. (London), pls. i-lxxviii., App. pp. 1-28.

SOMEREN, see VAN SOMEREN

STEINDACHNER, F.

1867a. in "Reise der Osterreichischen Fregatte Novara um die Erde in den Jahren 1857, 1859, unter den Befehlen des Commodore B. von Wullerstorf-Urbair. *Zool.*" **1**, pp. 1-98, pls. i-iii.

STERNFELD, R.

1911b. *Mitt. Zool. Mus. Berlin*, **5**, pp. 393-411.

1911c. *Mitt. Zool. Mus. Berlin*, **5**, pp. 413-420.

1911d. in "Die Fauna der Deutschen Kolonien (Berlin), **4**, part 2, pp. i-iv + 1-65, figs. 1-76, map.

1912c. in "Wiss. Ergeb. der Deutschen Zentral-Afrika-Expedition 1907-1908." (Leipzig, 1913), **4**, pp. 197-279, figs. 1-4, pls. vi-ix.

STERNFELD, R. & NIEDEN, F.

1911. *Mitt. Zool. Mus. Berlin*, **5**, pp. 383-385.

TORNIER, G.

1896. "Die Kriechthiere Deutsch-Ost-Afrikas. Beiträge zur Systematik und Descendenzlehre." (Berlin), pp. i-xiii + 1-164, figs. 1-11, pls. i-v.

1897. *Arch. Naturg.*, **63**, **1**, pp. 63-66.

1898. in Werther, C. W. "Die mittleren Höchländer des nördlichen Deutsch-Ost-Afrika." (Berlin), pp. 281-304, figs. 1-15.

1900b. *Zool. Jahrb. Syst.*, **13**, pp. 579-618, figs. A-H.

1902b. *Zool. Jahrb. Syst.*, **15**, pp. 578-590, figs. -.

VAN DAM, G. P.

1921a. *Ann. Transvaal Mus.*, **7**, pp. 239-243, pls. i-iv.

VAN SOMEREN, V. G. L.

1939. *Journ. E. Africa & Uganda Nat. Hist. Soc.*, **14**, pp. 155-160.

WERNER, F.

1898. *Jahrb. Abhand. Natur. Magdeburg* (1896-7), pp. 139-148.

1910a. *Denks. Med.-Nat. Ges. (Jena)*, **16**, pp. 279-370, figs. 1-15, pls. vi-xi.

1913a. in Brehm, A. "Tierleben." (Leipzig), ed. 5, **4**, pp. i-xvi + 1-598, figs. plates, maps.

1915c. in Michaelsen, W. "Beiträge sur Kenntnis der Land- und Süswasserfauna Deutsch-Südwestafrikas. III." (Hamburg), pp. 325-376, pl. vii.

WIEGMANN, A. F. A. & RUTHE, J. F.

1832. "Handbuch der Zoologie." (Berlin), pp. i-vi + 1-621.

WITTE, G. F. DE

1933m. *Ann. Mus. Congo Belge, Zool.* (1), **3**, pp. 55-98, pls. i-iv.